MARINE REVIEW.

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Commercial Side of the Canal Question.

For several days past an engineer representing the war department, and coming from the office of Major Thomas W. Symons of Buffalo, has been in Cleveland collecting, directly from vessel owners, reliable information regarding capacity of lake vessels, their speed, operating expenses, etc. It is explained that in addition to the appropriation made by the last congress for the work of the deep waterways commission, there was also a small appropriation entrusted to the engineer corps, and which was to be used along the same lines. Now it seems that as the deep waterways commission made no report on the advisability, from a commercial point of view, of constructing a ship-canal from the lakes to the Hudson, this feature of the subject is to be taken up by the engineer corps of the army, and will be dealt with in a report to be submitted by Major Symons to the war department. A gentleman who is acquainted with the work undertaken by the Buffalo engineer says:

"Major Symons' report will treat of the economics of the question in as thorough manner as the limited time and means at his disposal will permit. A proper study of the question involves a consideration of the methods, means and cost of transportation of the ocean, lakes, canals, and by rail. The last river and harbor bill contained an item for a survey of a ship-canal from the great lakes to the Hudson, but there was not sufficient appropriation therefor. Major Symons was directed to take the matter up and treat it as a preliminary examination, which means that he must advise whether the conditions justify such a work, and if so, to give reasons fully therefor. His report will deal very largely and principally with those business and economic features of the question not treated by the deep waterways commission, whose report has recently been submitted. It was to gather information in regard to lake transportation that Mr. Emile Low has recently visited Cleveland and is now in Chicago. Major Symons is assisted in the matter by Mr. Low and Mr. Wm. Pierson Judson, both of whom are members of the American Society of Civil Engineers."

In connection with the foregoing it may be said that the vessel owners of the lakes, who understand all sides of the great lakes-seaboard canal discussion, are not, as a rule, enthusiasts on the subject. They know that there is a great deal that is visionary in the talk of having a vessel pass from the lakes to the seaboard through a system of canals and then cross the Atlantic. But they are interested in the appropriation of $150,000 now pending in the senate for a canal survey, for the reason that they are desirous of having a part of this appropriation applied on surveys and inquiries regarding the project of increasing the navigable depth of water in Lake Erie, and in the lower Detroit river, by a dam at or near the head of Niagara river. In this latter question they have of late become very much interested. As noted in an article elsewhere in this issue, the legislative committee of the Lake Carriers' Association a few days ago decided to ask the senate to expend a part of the $150,000 appropriation for surveys relating to the Niagara dam project.

It is understood that Hon. W. J. White of Cleveland and W. J. Connors of Buffalo, owners of the steel steam yachts Say When and Enquirer, have made arrangements for another race between the yachts to come off early next summer Mr. Connors is trying to have the Buffalo Yacht Club enter a sailing boat in the big international contest on the lakes between Canadian and American yacht owners, and Mr. White has talked of building, on his own account, a yacht for the same purpose. Mr. Connors is making some changes in the boiler of his steam yacht, as a result of which he expects an increase of speed next season. In addition to his freight handling business at Buffalo, he recently closed a contract with the Western Transit Co. to supply provisions to all of the company's vessels and to hire and look after all men in the steward's departments of the ships.

About March 17, the Union Iron Works, San Francisco, will launch on the same day two light draft composite gunboats, Wheeling and Marietta, which they are building for the government.

Funds for Harbor Work, But no Gas Buoys.

The civil sundry appropriation bill, which carries appropriations aggregating $50,664,743.92, of which $15,131,000 is for river and harbor improvements, was passed by the house of representatives a few days ago, under suspension of the rules, and it has since been learned that notwithstanding the immense amount of government funds to be expended in accordance with this measure, it does not provide a single new aid to navigation on the lakes. Two or three small items are provided for the completion of lights already under way, but in the matter of gas bouys, for which the lake carriers and ship masters exerted themselves, there is again a complete turn-down. If anything is to be done towards an amendment in the senate providing for gas buoys, it would seem that the officers of the Lake Carriers' Association will have to hurry themselves, as the measure will undoubtedly be speedily handled in the senate. Items for harbor improvement on the lakes under continuous contracts aggregate $3,401,258. Lake items in the bill are:

River and harbor improvements—Completing 20-foot channel improvement, $1,090,000; Buffalo harbor, $500,000; Dunkirk harbor, $398,258; Cleveland harbor, $400,000; harbors of Duluth and Superior $500,000; Chicago river, from mouth to stock yards on south branch and to Belmont avenue on north branch, $113,000; improvement of water communication across Keweenaw point (Portage lake canals), $400,000; total $3,401,258.

Aids to navigation—For completing Chequamegon point light and fog signal station, Lake Superior, $1,500; to complete Grand Marais light, Lake Superior, and to construct additional range light on shore, authority to use $2,000 of unexpended balance; to complete establishment of system of gas buoys in St. Lawrence river at Charity shoals, Featherbed shoals, Rock island point, Sister island, Sunken rock, Bay State shoals, lower narrows, and entrance to upper Ogdensburg harbor, $7,600, to be immediately available.

Miscellaneous—For completing construction of two first-class revenue cutters for the lakes, $200,000; improving of marine hospital grounds, Cleveland, $2,725.

Names of New Bessemer Line Ships.

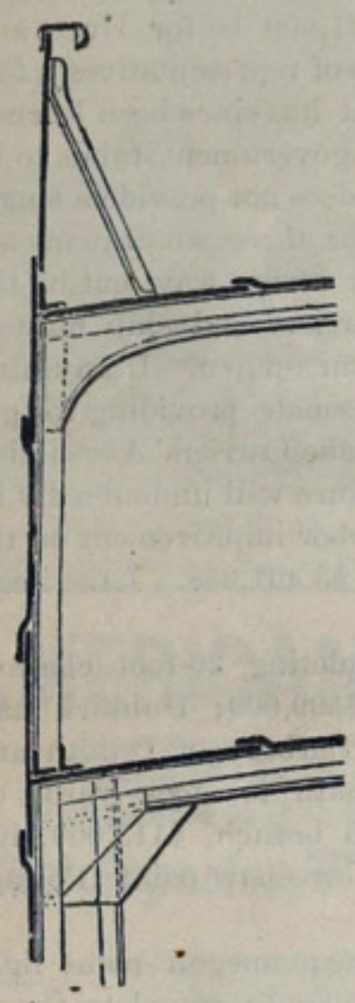
The Review is informed from the office of the Bessemer Steamship Co. in New York that the idea of honoring men prominently associated with the development of the iron and steel industry will be still further carried out in the selection of names for new vessels of the Rockefeller fleet. The name of the barge now being constructed for the Bessemer company by F. W. Wheeler & Co. of West Bay City, Mich., will be W. L. B. Jenney. Mr. Jenney is an eminent architect and engineer of Chicago, and the name is given because of his distinguished services to the iron and steel trade in connection with the invention and introduction of the lofty steel skeleton construction of buildings. The boat being built by the Globe company of Cleveland will be named Sidney G. Thomas. Mr. Thomas was the principal inventor of the Basic-Bessemer process.

A dispatch from Philadelphia says that the talk of the Cramps establishing a ship yard at Sault Ste. Marie is based entirely on an informal conversation which one of the officers of the ship building company had with a promoter of enterprises at the Sault. It was only one of hundreds of schemes that are presented to the Philadelphia ship builders. The Cramps were at one time very much interested in a lake ship building project, but the matter of providing work for their big Philadelphia plant has of late been quite an important problem. Anyhow, it is not at all probable that they would consider such a location as Sault Ste. Marie if they were seriously thinking of taking up a business on the lakes.

Although the navy department expected appropriations from the present congress for three new battleships, it is understood that the report of the committee on naval affairs, which will be submitted in a few days, will recommend the construction of only one new vessel.

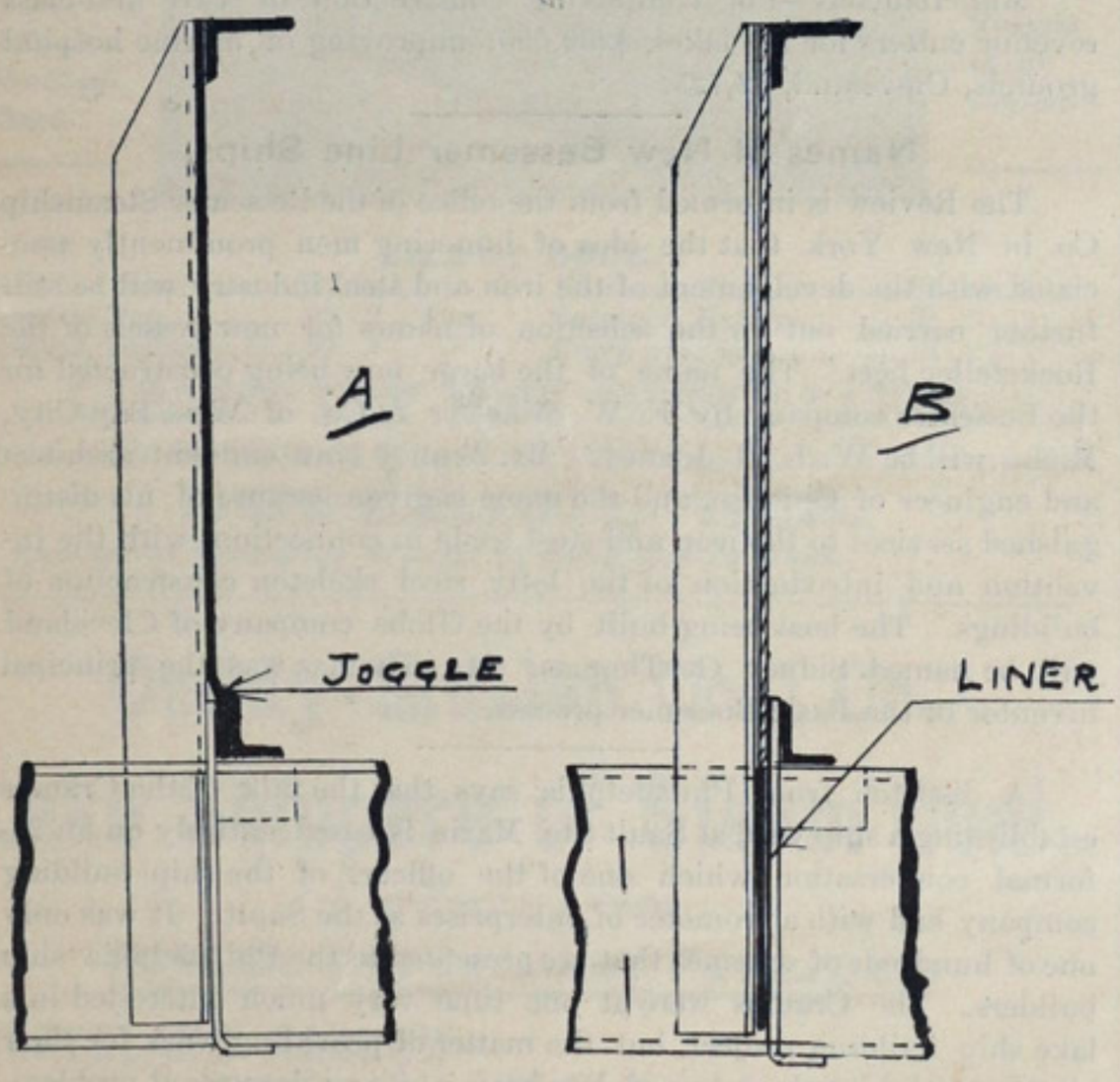
New Method of Fitting Shell and Deck Plating.

The American Steel Barge Co. is about to introduce at its ship yard in West Superior a new method of applying shell and deck plating to ships, which will effect a saving of about thirty tons in vessels of the 400-foot type, without any loss whatever in structural strength. Supt. Joseph Kidd of the West Superior yard has gotten up a machine for joggling and flanging plates and for beveling angles. It is claimed that with the machine curved plates can be flanged as cheaply and readily as straight ones. On the new barge building for the Interlake company a commencement has been made by joggling the girder plate over the intercostal as shown by sketch A, printed below. The joggling of this plate effected a saving of one and one-half tons of liner iron on one girder over the usual method indicated by sketch B. It is announced that the barge company is now ready to undertake the joggling process on the shell plating of an entire ship.



Section Showing Joggled Plates.

This method of applying shell plating is illustrated in the sectional sketch of a ship that appears to the left of this column. It was first undertaken by Wm. Doxford & Sons, well-known ship builders of Sunderland, England. The machine used by the English firm is illustrated in the Review of July 18, 1895. The process is of advantage mainly in dispensing with packing or lining pieces throughout, and at the same time securing an equally neat, light and strong job. Packing does not contribute to strength, but is merely an addition to weight, the absence of which is very much better than its presence; provided the structural items proper can be manipulated so as to bear closely "metal to metal." At present the shell and deck plating, with strakes worked on the usual raised and sunk, or "in-and-out" principle, have packing or filling slips fitted on every frame or beam, behind the outside or raised strakes. The new system dispenses with all such fillings, the improvement being effected by joggling or kinking the edges of each outside strake of plating over the edges of the adjoining inner strakes; every strake thereby being brought right home to the frames or beams without any intervening liners.



In view of the preparations made by the West Superior builders to undertake his method of construction, it may be of interest to note that on several vessels in England the system has been applied to plating throughout, from keel to gunwale, and from end to end, including, of course, deck and tank top. No difficulty whatever was found in carrying the joggling right out to the ends, where, owing to the curve and twist of the strakes, difficulty might have been anticipated. This even applies to oxter plates, or those under the counter, and plates above and below the propeller boss, as no difficulty is experienced in passing plates of any set through the joggling rolls. One vessel recently completed at Sunderland is of 2,700 tons register, the total weight of metal worked into her structure being about 1,300 tons. As compared with a similar vessel in which the joggling system had no place, there was a saving in weight of hull of about thirty-eight tons, or a net gain in material saved of 2 per cent. Three-fourths of this total was made up of the weight of packing and liners dispensed with, and close on one-fourth of it by the weight of cement saved, owing to the outer strake of plating on bottom being brought up close to the frames. As regards labor, the gain was also clear and considerable. The work of riveting through two ply of material is obviously less difficult and exhausting than through three ply, as is the case when packing is present. The work of fitting, tapering and punching the packing pieces and liners is in itself no small item, and dispensing with it means, in the case of large vessels, a saving of some consequence. There is, of course, to be deducted from this total saving in labor and material the cost of joggling the plates by the special machine, which is said to be only about one-tenth of the total. The gain in carrying capability is not quite equivalent to the thirty-eight tons of material saved, because from this figure must be deducted some ten tons of loss in displacement due to the finer form of the hull caused by the inward indent given to the outer or raised strakes of plating by this system. The perpetual gain, however, of some twenty-eight tons carrying power secured by this system in a vessel of 2,700 tons register over a vessel of the same size built on the ordinary principle, is a consideration which ship owners will be glad to note and appreciate. As regards the important question of structural strength, it is quite obvious the system affects it only for its betterment. The ideal in structural work of "metal-to-metal," without packings or filling of any kind, is attained, and the joggling, especially when carefully carried out, being in the nature of a corrugation of the plating, adds to the rigidity of the material.

In all the tales that have been told and all the songs that have been sung of our naval heroes, there is one branch of the service that has been greatly neglected. Until late years, little attention has been paid to the engineer corps, but the defect of literature in this regard has recently been partly remedied by the publication of a work entitled "The Steam Navy of the United States," by Passed Assistant Engineer Frank M. Bennett, U. S. N. The book is practically a history of the engineering force. Mr. Bennett is still in the active list of the service and is attached to the United States monitor Amphitrite. His book is published by Warren & Co. of Pittsburg, Pa., and contains over 900 pages, bound in navy blue vellum cloth and illustrated with over 100 drawings of machinery, boilers and methods of propulsion, beside pictures of many of the earlier and more modern types of warships. Every statement in the book is based upon historical facts as they appear in the records of the navy department at Washington, and the volume, being the only work that has ever been written that treats of the inception and growth of the steam war vessel of the United States, is one of great value not only to the student of our naval history but of American history as well. The work begins with the first steam war vessel ever built in our navy and which was also, by the way, the first steam war vessel of the world, and traces from that crude and clumsy beginning the slow development of the naval steamer into the intricate and delicate pieces of mechanical ingenuity that form the warship of today, and into this narrative is woven the history of the engineer corps of the navy.

In a letter to his son, John W. Warner of Cleveland, Capt. J. J. H. Brown of Buffalo, ex-president of the Lake Carriers' Association, pays a tribute to the memory of Capt. George Warner, who died at his home in Cleveland on the 6th inst. Capt. Brown says: "I learned with regret that my old friend, your father, passed away a week ago today. My acquaintance with your father commenced forty nine years ago this coming summer, when I was a little boy, and he was second mate of a schooner, I think it was the Wing & Wing. In my younger days he did me a great kindness, and I have entertained a very friendly feeling for him ever since."

Important Legislative Matters.

At a meeting of the legislative committee of the Lake Carriers' Association in Buffalo, a few days ago, it was agreed that the association should take part in the work of the committee on the restoration of the American mercantile marine, and Messrs. F. J. Firth, chairman, H. D. Goulder and Charles H. Keep, were appointed to represent the association on such committee. This committee is made up of representatives of shipping associations and steamboat companies from all parts of the United States. It is being organized for the purpose of suggesting to congress the best method of assisting the mercantile marine.

A resolution was also adopted to the effect that the Lake Carriers' Association favors the principal of the so-called Patterson bill, now pending in congress, being a bill to permit railroads under the supervision of the interstate commerce commission to pool earnings, and Mr. E. T. Evans, who was elected chairman of the committee on legislation, was authorized to appoint at any time a committee to represent the association in Washington in favor of that bill. The ultimate purpose of the Patterson bill is to secure stability of rates among rail carriers, and thereby to do away with the abuse of discrimination between different shippers. As the lake carriers have to compete with the rail carriers in very important lines of trade, it is considered that anything tending to secure reasonable and stable rates for the rail route would have a tendency in the same direction so far as competing water carriers are concerned.

The bill providing for the licensing of officers and inspection of hulls of sailing vessels of 700 tons and over was laid aside without action. It was the opinion of those present that the Lake Carriers' Association was indifferent as to whether the government extended the inspection service, now confined to steam vessels, to sailing vessels or not, but that if it was extended to sailing vessels, they should be treated alike and the smaller sailing vessels inspected as well as the larger. It was suggested that the licensing of officers and the inspection of hulls was designed not only to protect the lives of those on board such vessel, but also to secure the safety of other vessels navigating the same waters, and that there was now more danger to the larger class of lake vessels from small sailing craft than from the larger class of sailing vessels and tow barges. The larger vessels are generally seaworthy and officered by competent men, but the little hookers and fishing vessels are often unseaworthy, and improperly officered and thereby become a menace to other craft.

The secretary was directed to confer with Senator Davis of Minnesota, who has given notice that he will seek to amend the sundry civil bill by inserting therein an appropriation for a survey and estimate on the deep water project from Lake Erie to the seaboard, and to endeavor to have Senator Davis incorporate within the scope of his amendment a report, survey and estimate on the project of increasing the navigable depth of water in Lake Erie, and in the lower Detroit river, by a dam at or near the head of the Niagara river.

Improvements in the Big Steel Barges.

West Superior, Wis., Feb. 16.—As a result of experience gained in the construction of a large number of steel vessels, the members of the firm of Pickands, Mather & Co., as well as Mr. A. B. Wolvin, who is interested in the big steel barge building here for the Interlake Co., are at all times taking advantage of improvements that are suggested in the operation of vessels of this kind. They are introducing some new features in this barge, and it can be said also that Capt. McDougall is sparing no effort to make the vessel as complete, both as regards workmanship and equipment, as any vessel on the lakes. Then, too, there is a spirit of rivalry involved in the fact that a similar vessel, to be built by F. W. Wheeler & Co. for the Bessemer Steamship Co., will undoubtedly be provided with everything that may be regarded necessary by the builders to make her complete. In the construction of the Bay City boat, Robert Logan, naval architect of Cleveland, is representing the owners, and he has also advised the owners of the barge that is being built here, but their direct representative at the ship yard is Robert Curr, who has been connected with Cleveland ship yards.

"I am satisfied," Mr. Curr said today, "that any expert can go through this vessel after she is completed and he will find every riveted connection perfect. The same may be said of everything pertaining to the workmanship. In fact, I have never seen better work done anywhere. For some time past the tendency with steel vessels on the lakes has been to have everything of steel. First steel deck houses replaced wooden houses. Then forecastle decks were made of steel, and now in this vessel we have another departure in the introduction of steel ceiling, instead of the regulation pine and oak, and also in the introduction of steel spars."

It is understood that the barge building at West Bay City will also have steel spars and steel ceiling, the latter of which represents quite an important item of cost. These are the first American freight vessels on the lakes to be fitted with steel spars. The Northern line passenger steamers have them and also two or three of the Canadian vessels built on the other side, but the supply of oak for spars has thus far been so liberal in this country that it has not been thought necessary to make them of steel. The wooden spars would be cheaper even now, but the drift towards all steel vessels is causing owners to take to the steel.

Another improvement in the Interlake Co.'s barge will be the adoption of special deck engines for handling wire mooring lines, which will be used instead of manilla hawsers. This will do away with capstans amidships, and one of these machines, under another arrangement, will fulfill the duty of an ordinary deck hoister in handling sail lines.

The Minnesota company's steamer Matoa is in the barge company's dry dock hard and fast. On account of severe weather here, repairs in the dry dock stop early in January, so that the last boat generally stays in the dock until the ice goes out in the spring. The dock is filled with water and allowed to freeze. By doing this the ice on the outside of the dock is prevented from pushing in the sides. The company has had quite a few extensive repair jobs and will have more to do before the fleet leaves in the spring.

The work of lengthening and otherwise improving the whaleback steamer Joseph L. Colby and her consorts, barges 201 and 202, which were brought to the lakes from the Atlantic coast last summer, is about finished. The Colby will have when finished a new tank top, half an inch thick. The work on the barges, which have been lengthened 61 feet 4 inches, is of a creditable kind. The vessels were hauled out lengthwise on a slip to a height of 4 feet, so that the men could work under their bottoms.

Senator Frye and the Shipping Interests.

Washington, D. C., Feb. 17.—Since it has been announced that Senator Sherman will go into the cabinet of President-elect McKinley, representatives of the shipping interests of the country have been wondering whether Senator Frye would naturally succeed to the chairmanship of the senate committee on foreign relations. This would involve a surrender, on the part of Senator Frye, of the position of chairman of the senate committee on commerce, and is a matter of moment to the shipping interests, as Senator Frye is the most influential man in congress on maritime subjects, as well as the most widely informed, and in the senate almost the only man to push legislation on these subjects. Other members of the commerce committee, from whom a chairman would be chosen in event of a change in March next, are John P. Jones of Nevada, Matthew S. Quay of Pennsylvania, James McMillan of Michigan, Watson C. Squire of Washington, Stephen B. Elkins of West Virginia, Knute Nelson of Minnesota and George W. McBride of Oregon.

But it is hoped, on account of Senator Frye's devotion to maritime interests, that he will retain his present position on the commerce committee, and your correspondent is, in fact, reliably informed that he has practically decided to do so, and that Senator Davis of Minnesota will probably be the chairman of the committee on foreign affairs. Had Senator Frye reached a different conclusion it is quite probable that Senator McMillan of Michigan would have been chairman of the committee on commerce. As matters stand, with Senator Frye as chairman, and Senator McMillan representing the lake interests, and Senator White representing the interests of the Pacific coast, the committee will continue to remain one of the strongest in the senate.

In the light-house board there are rumors of big changes that may, contrary to expectations, take place before the new administration comes into power. The retirement of the chairman of the board, Admiral Walker, is not due until about March 20, but there has been some talk of his retiring at an earlier date, in order to admit of the present administration appointing his successor and also making other changes in the board.

Big Dredging Contract.

A full summary of bids received by Major Clinton B. Sears, United States engineer at Duluth, on the big dredging job that is to be prosecuted in Duluth-Superior harbor during the coming four years is printed herewith. The material is all of a soft kind, but the average price of 7 88-100 cents per cubic yard is nevertheless wonderful. The estimated amount of material to be removed is 21,000,000 cubic yards, and it is thought that this will require the services of twenty dredges

ABSTRACT OF PROPOSALS RECEIVED AT DULUTH, MINN., FOR DREDGING IN THE HARBORS OF DULUTH AND SUPERIOR—OPENED FEB. 15, 1897, BY MAJOR CLINTON B. SEARS, CORPS OF ENGINEERS, U. S. A.—AMOUNT PROPOSED TO BE EXPENDED ON THIS WORK AND FOR WHICH CONTRACTS HAVE BEEN AUTHORIZED, ABOUT $1,850,000.

BIDDERS.	District No. 1, 13,563,000 cu. yds.	District No. 2, 5,264,000 cu. yds.	District No. 3, 2,173,000 cu. yds.	TOTAL.
	Per cubic yard, scow measur'm't			
Eugene Breymann, John B. Breymann, Toledo, O.	10¼ cts	11 cts.	13½ cts.	$2,275,762.50
P McDonnell, Duluth, Minn.	7½	8	10	1,655,645.00
Chas. S. Barker, West Superior Wis.	7½	8	10	1,655,645.00
American Dredging Co. et al, Philadelphia, Pa.	9	10	11	1,986,100.00
C. E. Mitchell & Co., Ludington, Mich.	11	13	15	2,502,200.00
Williams, Green & Williams, Duluth, Minn.	7½	8	10	1,655,645.00
Samuel O. Dixon, Racine, Wis.	12½	15	18	2,876,115.00
The Lydon & Drews Co, Chicago, Ill.	12.7	13.7	14.3	2,754,408.00
Alphonzo B. Powers, San Francisco, Cal.	12½	12½	12½	2,625,000.00
Wm. A. Starke, Milwaukee, Wis.	10	11	13	2,217,830.00
The L. P. & J. A. Smith Co., Cleveland, O.	12	12	15	2,585,190.00
James Rooney, Toledo, O.	10	11⅛	13¼	2,229,842.50
R. J. Cram, Detroit, Mich.	12¼	13⅛	15⅛	2,681,033.75

Average price, per cubic yard, $7\frac{88}{100}$ cents.

working steadily throughout the four seasons. The local dredging concerns, all of whom were the same as to price in their bids, will very probably be accorded the contract, and will secure assistance from other firms in carrying it out, as their dredging capacity is not sufficient to care for the whole work. It will be noted that there are two bids from the coast, one of which is from a Philadelphia combination of dredgers. It is said that this bid from the Atlantic coast concerns, which was next to the lowest, was prompted by the fact that Breyman Bros. of Toledo went to Boston, recently, and secured a big contract for dredging in that harbor.

An article of a column length in a recent issue of the Detroit Journal declares, with great display headlines, that Nicholas Huff, engineer of the Detroit, Belle Isle & Windsor Ferry Co., is a very modest man, but the tale that follows is hardly suited to the assertion. In a hair-splitting account of a trip down Lake Superior on the steamer Siberia in the fall of 1883, Mr. Huff parades his own bravery in a manner that would do credit to a dime novel hero, and during all the excitement and pending disaster, on account of broken bulkheads, falling spars and shattered hatch coverings, he has Capt. John McArthur seated on a steam pipe in the engine room awaiting death in fear and trembling. This is the John McArthur who commanded the Christopher Columbus, and who is recognized as one of the bravest and most capable men following the lakes. Probably the newspaper reporter's imagination is responsible for the story. It would seem so, as there are many ridiculous statements in it, such as "a hurricane outside of Duluth with the wind from the northwest," and Eagle Harbor located on Michipocoten island.

Over one hundred of the best class of lake steamers are using the steel range manufactured by Russell & Watson of Buffalo. The Northern line freighters and nearly all of James Davidson's large freighters are using them. Russell & Watson have recently published a catalogue of signal lamps which they manufacture, and in it are the latest laws regarding necessary lights for navigation on the great lakes. Copies will be furnished to owners, captains and mates who apply for them.

Among Canadian Marine Men.

Toronto, Ont., Feb. 17. At the annual meeting of the Canadian Marine Engineers' Association the following officers were elected: O. P. St. John, honorary president; E. J. O'Dell, president; J. S. Adams, first vice-president; F. Limpert, second vice-president; councillors, R. Childs, Jas. Currie, R. McLaren, Ed. Abbey, W. B. Stevens; secretary, S. A. Mills; treasurer, D. L. Foley; guard, J. R. Young; auditors, J. H. Ellis, F. E. Smith. The auditors presented their report for the year 1896, and stated that the balance in hand amounted to $300.

The Montreal Transportation Co. of Kingston has called for tenders for a composite river barge to ply between Kingston and Montreal. Plans are being prepared by the Canadian Locomotive & Engine Co., the Kingston Foundry Co. of Kingston and the Bertram Engine Works, Toronto.

The first iron vessel to be built at Levis, Quebec, is now under construction. It is to be a steamer 140 feet in length and 25 feet beam, and is to attain about 15 knots speed. This vessel will be on the ferry route betweeen the City of Quebec and St. Thomas, Montmagny.

A public meeting at Owen Sound, last week, pronounced favorably upon a project to increase the elevator capacity at that port to 800,000 bushels of grain and erect flour sheds to store 30,000 barrels of flour. The people of Kingston are also talking of better facilities for the storage and transfer of grain. They are discussing the advisability of erecting an elevator of 500,000 bushels capacity.

Miscellaneous Matters.

W. F. Herman, general passenger agent for the Cleveland & Buffalo Transit Co., will hereafter have charge of the company's freight department, with the title of general passenger and freight agent.

Dispatches from the Pacific coast report the steamer Mackinaw, which was built at West Bay City, Mich., ashore near Port Townsend, Wash., and in danger of becoming a total loss. The Mackinaw is owned by the Saginaw Steel Steamship Co.. of Saginaw, Mich. A sistership, the Keweenaw, which went to the Pacific from the lakes with the Mackinaw, was lost some time ago with all hands.

In "Midshipman Farragut," which treats of the early life of the distinguished admiral, James Barnes, author of "For King or Country," etc., tells a story of the boyhood of Farragut to boys of today. The book is particularly adapted for boys, calculated to inspire in them a healthy love for things that are manly, patriotic and heroic. It is published in their best style by D. Appleton & Co., New York.

Another neat catalogue just issued by the Brown Hoisting & Conveying Machine Co. of Cleveland contains many new half-tone engravings of an excellent kind illustrating hoisting and conveying machinery applied to pig iron furnace plants, ore and coal docks, ship yards, etc., in all parts of the country. Illustrations of machinery in the ship yard of the Newport News company and on the docks of the Cleveland & Pittsburg Ry. Co., Cleveland, are especially interesting.

John Wiley & Sons of New York have just published a book of 750 pages and 500 illustrations treating of the mechanical engineering of power plants. The work is by Frederick R. Hutton, professor of mechanical engineering in the school of engineering of Columbia University. It is intended primarily as a text book for class room work in the engineering school, but another object is to enable perons in responsible relations to power plants to gain such information as will permit of their judging of the soundness of power house practice without going into problems of design that might be entirely foreign to them.

H. C. Burrell of Lorain, who has for several weeks past been conferring with vessel owners and ore shippers at Cleveland, Chicago and other points, with a view to opening up a marine reporting agency on the Detroit river next season, has decided to go ahead with the undertaking, and has assured a few people who have promised him work that he will certainly carry on the business for the full season of 1897. He has enlisted the support of a great many vessel captains, who have been dissatisfied with certain features of the Detroit river service, and says that although he may not in the beginning get from vessel owners much of the work of delivering orders for shifting vessels, etc., he will be so situated that he can await patronage in that line.

The New Insurance Combination.

A good likeness of W. A. Prime, who is taking quite an important part in insurance matters on the lakes, is printed herewith. Vessel owners who met Mr. Prime at a meeting held in Cleveland recently to discuss the new Great Lakes Register were satisfied that, although a young man, his experience in insurance matters is by no means limited. He has been with the insurance brokerage firm of Charles E. & W. F. Peck of New York, Chicago and London for ten years past, and has been the moving spirit in securing for that firm and their associates control of the great bulk of the package freight, grain and flour insurance on the lakes, as well as practically all of the insurance on flour exports from the Atlantic seaboard. One of Mr. Prime's greatest achievements in this line was the invention of the "all risks clause" in flour insurance. His operations now in connection with the publication of the new insurance register, and the establishment of a combination of insurance companies and brokers that is planning to control a large part of lake hull insurance, are quite fully understood by vessel owners. It has been reported within the last few days that the St. Paul Fire & Marine is one of the latest companies to join hands with the combination. It is also stated on very good authority that the publication of the new register will cost fully $20,000.

Association of Dredge Contractors.

Dredging contractors on the lakes are making no secret of the provisions of the constitution of their association, which is to be known as the Dredge Owners' Association of the Great Lakes, and which will have headquarters in Detroit. It is claimed that all but two or three of the contractors on the lakes have now signed the constitution, which involves the articles of agreement. Those who had not signed up to a few days ago were expected to join the association within the present week and it was said, anyhow, that they were not owners of large plants. The agreement recites that the supply of dredge plants on the lakes is so much too great for the demand in that line of work as to have caused undue and ruinous competition in bidding in recent years, especially in 1896, which has resulted in all of the plants being operated at prices that do not make a fair and reasonable return on the investments; and, further, that the character of the service afforded at these prices is and must be inferior to that which could be given at reasonable rates, and that the inevitable tendency of such competition would be to drive many of the dredging plants out of the business.

The basis of the organization is a section providing that each member shall pay into the association on the 10th business day of each month 2½ per cent. of the gross income of his plant. When these assessments amount to $5,000, the treasurer begins to distribute, on the 20th business day of each month, all surplus above this fixed reserve. Each member participates in the distribution of the surplus according to the ratio which the value of his plant bears to the total value of the plants owned by all the members. This is with the understanding, of course, that members sharing in the distribution are employed upon work paying a per centage,or idle, ready immediately for work if called upon. Fixed rules are provided for the valuation of all plants. The full force of this section will be understood when it is known that practically all work on the lakes will be contributing to the mutual fund and that another clause provides that no member of the association shall do any work under a contract, private or otherwise, for any contractor not a member of the association having no dredging plant of his own; but this does not apply to dredging in combination with other work, where dredging forms the minor part.

In commenting on the effect of this mutual fund built up from the monthly assessment of 2½ per cent. of gross receipts, a clause in the constitution says: "It is recognized that this practice will raise prices of dredge work from one to five per cent.; in other words, it may affect the price a fraction of a cent per cubic yard, though it will not necessarily have that effect. It can not raise prices more than 5 per cent. It is believed that if any increase in prices is thus occasioned,it will benefit rather than injure our patrons and the public, by tending to establish a reasonable and stable scale of prices, by insuring the continuance of all the dredge concerns in the business on the lakes, and by improving the character of the work done."

Other objects of the association as set forth by the constitution are: To procure information concerning all prospective contracts and work, and to disseminate such information among the members as long before the commencement of such work as possible; to facilitate the procuring of bidders' bonds at reasonable expense; to secure the most advantageous form of insurance, and reasonable rates of premium thereon; to assist one another by furnishing the use of dredges, tugs and other equipment, and men, at reasonable prices, and to provide for the arbitration of any difference among members as to the amount which should be paid for such assistance. A clause in the constitution provides strict rules for arbitration, entirely within the association.

The control and management of affairs of the association is vested in an executive committee, consisting of one member from each of seven districts, which comprise Lake Superior, St. Mary's river, Lake Michigan, Lake Huron, St. Clair river, Lake St. Clair and Detroit river combined, Lake Erie and Niagara river combined and Lake Ontario. Names of members of this executive committee, as well as the president and vice-president, were printed in the Review of last week The important officer, the secretary and treasurer, whose name has not as yet been announced, will have headquarters in Detroit and will be paid a salary not to exceed $3,000 a year. He is to devote his entire time to the business of the association and shall not be in any manner whatsoever interested in any dredging plant, firm or company or any dredging work.

The assessment above referred to is not to be increased at any time above 2½ per cent., except by regular amendment to the constitution, but the executive committee is empowered to reduce or entirely remit the assessment in any special case where hardship would result from strict enforcement of the rule regarding it. For determining the value of plants, upon which the distribution of surplus funds is to be based, the following rule has been adopted: "Each dredge shall be rated at the product in dollars of the piston displacement in inches, of her high pressure cylinder or cylinders in the main engine multiplied by seven; and in case of compound cylinders, one fifth of the piston displacement in inches of the low pressure cylinder or cylinders of the main engine shall be added and multiplied by seven; single crank dredges to have their piston displacement increased 33⅓ per cent. The decision of the executive committee to be final as to all such ratings."

Mr. W. I. Babcock.

Having come into possession of a good photograph of Mr. W. I. Babcock, the successful manager of the Chicago Ship Building Co., the Review is prompted to reproduce it in the small half-tone engraving that appears herewith. With five steel vessels of the largest type under construction at the South Chicago yard, in addition to a large amount of repair work, and with a dry dock plant equal to the best on the lakes, Mr. Babcock certainly has reason to feel proud of the part he has taken in establishing this enterprise. He had a thorough training in ship building and marine engineering matters before undertaking the management of the Chicago plant. As noted recently, a financial statement presented at the annual meeting of this company last month showed a surplus of about $225,000, after the payment of an annual 6 per cent. dividend, which is dispersed half in February and half in August. This surplus is equal to half of the capital stock of the company, which is $450,000. The company has paid dividends regularly at the rate of 6 per cent. per annum, adding all other earnings to surplus. It is announced that there is not a dollar of bonded or floating debt or other obligations further than current accounts. The output of the company in new ships during 1896 is placed in round numbers at $1,000,000, and the work now under way is valued at $900,000, insuring a larger business in 1897 than that of the past year.

Capt. James Reid says that more than $40,000 has thus far been expended in the effort to raise the Cayuga.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ½ per cent. of the whole, but largely in American vessels.

As noted in a report of a meeting of the legislative committee of the Lake Carriers' Association, printed elsewhere in this issue, the association has decided to take part in the preparations that are being made by ship owners in all parts of the country, to present to the incoming congress and to President McKinley a scheme for protection to American shipping. The lake interests will be represented in this matter by F. J. Firth of Philadelphia, Harvey D. Goulder of Cleveland and C. H. Keep of Buffalo. In the preparation of a measure for the restoration of the American mercantile marine, the opinions of these gentlemen will undoubtedly be of great value. They will have no hobbies and no personal ends in view, as the lakes are interested only indirectly in the question of subsidies or other measures of assistance for American vessels in the foreign trade. It is now quite certain thatn o measure involving discriminating dutieswil l be recommended to the new administration. The feeling against discriminating duties has developed wonderfully since attention has been directed to the Elkins bill, which provides that a duty of 10 per cent. ad-valorem, in addition to the duties now imposed by law, shall be levied on all goods imported in ships not of the United States; and that any and all clauses in existing treaties in contravention thereto shall be abrogated and repealed. Probably the strongest protest made against this bill comes from the Philadelphia Maritime Exchange. One feature of this protest is as follows: "The protection sought to be given to the American ship owner by the proposed tax of 10 per cent. on the value of the merchandise carried would be most unequally distributed. On a cargo of iron ore the tax would amount to about 20 per cent. of the freight, while on a cargo of sugar or tobacco it would be fully 300 per cent.; on corn it would be 50 per cent.; on provisions 200 per cent., and so on; discriminating between ship owners in the first named instance to the extent of giving fifteen times as much protection to one as to the other. In high valued merchandise, such as silks, etc., this unjust discrimination would be still more appalling."

Quite a few readers of the Review are known to be earnest students of subjects pertaining to the cost of transportation by water as againt cost by rail. Mr. George Tunell is engaged in writing for the Journal of Political Economy, which is published by the University of Chicago, a series of very interesting articles on lake transportation. In a letter received recently he asks the Review for information along certain lines suggested in the preparation of these articles. Probably some of the readers referred to above would be pleased to take up in these columns, or by correspondence with Mr. Tunell, the points suggested in his letter. He says: "In talking over an article on 'Lake Transportation and the Grain Traffic' (which I am now preparing for publication) with Mr. Peabody, the editor of the Railway Review of Chicago, he made a statement which surprised me. He asserted that the motive power required to move a certain amount of freight over rails is less than that required to move a like amount of freight through water. Mr. Peabody even went so far as to contend that the expenses of movement were less in the case of railroads than in the case of lake vessels. He, of course, did not include fixed charges in the case of railroads. The Pennsylvania Company, he said, had made some experiments, a few years ago, which led them to believe they could meet any rates which the lake carriers might see fit to make on grain. The statistics which I have thus far compiled seem to show that there is an increasing tendency to ship wheat and flour by rail. What is the explanation? To what extent are terminal charges responsible for this diversion of traffic? Is New York the natural export port for grain shipped by lake vessels to Buffalo? Are the charges at New York excessive? Is grain still lightered from cars to vessel at New York? Can it be said in general that the lake carriers have greatly reduced their charges but that terminal charges (transfer and storage charges and commisions) have not fallen to anywhere near the same extent?"

The transfer of Senator Sherman from the chairmanship of the senate committee on foreign affairs to the cabinet of President McKinley will leave Senator Frye of Maine the ranking member of that committee. Under the precedents Senator Frye would become chairman of the committee on foreign affairs, which ranks first among the senate committees. But Senator Frye is at present chairman of the committee on commerce, a position which, while ranking lower than the chairmansbip of foreign affairs, is of great importance to the maritime and navigation interests of the country. Regard for dignity and ease offers a strong temptation to Senator Frye to take the chairmanship soon to be vacated by Senator Sherman. But the Review speaks for the marine interests of the whole country in urging him to retain the chairmanship of the committee on commerce, where for years he has rendered services to American shipping which are appreciated wherever the stars and stripes float over an American vessel. The unfair and unfounded criticism to which he has recently been subjected in some newspapers render the present an especially apt time for calling attention to the great energy, industry and intelligence which he has brought to bear in promoting measures for the improvement and development of our commerce.

There will be no further retirements for age in the engineer corps of the army until 1901, when General John M. Wilson and Colonel Henry M. Robert will make vacancies. There will be one retirement in 1902, Colonel J. W. Barlow; two in 1903, Mansfield and King; four in 1904, Allen Hains, J. A. Smith and Damrell; four in 1905, Gillespie, Benyaurd, W. A. Jones and Handbury; four in 1906, Raymond, Sutor, Ernst and Stanton. In 1907 and 1908 a cyclone will strike the corps, sweeping into the doldrums of the retired list no less than twenty officers, clearing away all the officers above the rank of captain, except ten majors—M. B. Adams, Lockwood, Ruffner, Mahan, Knight, Marshall, Bixby, Rossell, Symons and Leach. Other casualties aside, Major Adams will then be the head of his corps, for nearly a year, to be followed by Major Lockwood. Then Major Mahan will hold the fort, until he is succeeded, March 28, 1911, by Major W. H. Bixby. There will then be but two survivors of the present noble army of majors on the active list, viz., Bixby himself and Leach, who has just received his promotion to major by the retirement of General Craighill and appointment of General Wilson.—Army and Navy Journal.

In the language of the street, there are a great many men in the iron business who are still of the opinion that Mr. Carnegie is not "the only pebble on the beach." He has brought about a revolution of prices, and will have some advantages over all competitors, but the lake carriers, the railways and the producers of iron ore and fuel will all find the means of making similar reductions to other manufacturers who may be strong enough to survive the present great change in the iron industry.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building.

Extend Mail Delivery Service to the Sault.

The rebuke given by the house of representatives to Congressman Corliss of Detroit on account of his opposition to the Detroit river marine service was of a kind seldom heard of in Washington, but it was no less than might be expected, in view of the fact that the Detroit representative had, from a selfish political standpoint, set himself against the entire shipping interests of the lakes. Now that a fair appropriation is secured for the Detroit service, and attention has been directed to the great volume of mail delivered to and taken from vessels passing that point, it would seem that an effort should be made to extend the delivery service to Sault Ste. Marie. Postmaster Enright of Detroit is entitled to a great deal of credit for interesting the post office department in the work on the Detroit river, and the postmaster at Sault Ste. Marie, although his office or influence may not be so large as that of Mr. Enright, can make a reputation for himself by taking this matter up. He will have the support of the shipping interests, as the Lake Carriers' Association at its last annual meeting adopted a resolution favoring free delivery at the Sault. The postoffice department can secure from officers of the war department in charge of the United States canal full information regarding the large amount of mail matter handled in the canal office, and they will find the information ample to warrant them in going ahead with the extension of the marine service.

When there was only one canal in the St. Mary's river the demand for delivery of mail to passing vessels was not urgent, as the mail was cared for in the canal office and distributed to vessels while in the lock. But since the establishment of the Canadian canal the situation is different. Vessels passing to or from Lake Superior take either canal, according to conditions confronting them on arrival at the Sault, and there is therefore no certainty as to whether mail should be addressed to them in care of one or the other of the canal offices. A delivery service in connection with the service at the canal office would reach all vessels, and would place the postal business enirely in the hands of the postoffice department where it properly belongs. One of the marine reporting agencies at Sault Ste. Marie tried to maintain a postal delivery service last season, but it was limited and the steam vessel engaged in it was laid up some time before the season was at an end, on account of the loss of money in the effort. Another effort is now being made to secure money enough from vessel owners to operate this vessel during the coming season, but whether the effort is successful or not, it is certainly the duty of the government and not the vessel owners to provide for such delivery of mail. Ninety per cent. of the letters are purely personal to members of crews and to passengers during the tourist season. The vessel owners, who will have their telegrams and important letters delivered no matter what the expense may be, will not suffer great loss on account of a continuance of the present unsatisfactory system, but the thousands of men who are employed on the vessels, together with their families, will be at a great disadvantage regarding their mail at Sault Ste. Marie until the postoffice department takes the matter up and gives it the attention that has been accorded to vessels passing Detroit.

Since writing the above we have received the following on the subject from a correspondent at the Sault: "The postmaster here has recommended that a regular sub-postoffice be established in the new office building of the American canal, which will soon be completed, and he feels confident that the same will be installed in the near future. By this arrangement the marine interests will get much more efficient service than heretofore, the mail being pouched direct to this sub-office. It is also the prevailing opinion here that there will be very little traffic through the Canadian lock this year, for the reason that our new lock is being thoroughly overhauled this winter, and between the old and the new lock, the American canal should care for practically all of the American traffic. But even in event of success with these arrangements, there will still be some American vessels using the Canadian canal, and at times a great many of them may do so, and the mail service will thus be somewhat incomplete in any event unless delivery methods are undertaken."

The Engineer of London, issue of Feb. 5, 1897, contains a two-page article on car ferry lines of the lakes, with illustrations of the St. Ignace and one of the Ann Arbor ferries.

A photograph of the largest boat on the lakes, the Sir Henry Bessemer, will cost you only $1.50. Write the Marine Review.

Lake Carrier's Finances.

Executive officers of the Lake Carriers' Association will very porbably find it necessary to give careful attention to funds of the organization during the coming year. It will be remembered that, although the dues were uniformly 3 cents per net registered ton last season, the association closed up its affairs in 1896 with a deficit in the treasury. Then at the annual meeting in January last the rate of assessment on all vessels of 1,200 tons and under that amount was reduced to 2 cents, leaving the rate on the larger vessels at 3 cents. This reduction on the smaller class of vessels for the present year will be applied to 211,564 tons according to 1896 membership, representing a loss in revenues of $2,115.64. To offset this loss there will probably be enlisted in the association new vessels to the extent of about 40,000 tons, which at 3 cents a ton would amount to $1,200. But there would still be a loss of $915.64, and the deficit of 1896 is also to be paid. It is not expected, however, that any extraordinary expenses, such as were involved in the Detroit river bridge fight, will be met with during the coming year, and with this hope the officers of the association will try to make a better financial report to the members next January.

Elegant Pleasure Craft.

The Gas Engine & Power Co. and Charles L. Seabury & Co. of New York, which concerns were recently consolidated, have been closing a few contracts of late for pleasure boats of a very elegant kind. They will build for P. A. B. Widner of Philadelphia, owner of the yacht Josephine, a tender that will be 30 feet long and 7 feet beam. The hull—keel and frames—will be of oak, but outside planking will be of mahogany, bright varnish finish, and rubbed down. The general finish will be in mahogany. There will be three cock-pits, with melon-top awnings, which fold down around the coamings and occupy small space. The machinery will consist of a Seabury fore and aft compound marine engine, with feed and air pump attached, and the boiler will be of the latest Seabury design and of water tube type. The speed will be 9 to 10 miles per hour. This launch will be somewhat similar to the launch built for W. K. Vanderbilt. Other contracts include a 40-foot naphtha launch with a motor of 12 horse power for C. H. Osgood of the New York Yacht Club and a 20-foot naphtha launch for Harrison B. Moore, also of the New York Yacht Club.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Feb. 13, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	11,617,000	6,977,000
Duluth	3,844,000	18,000
Milwaukee	305,000	4,000
Detroit	302,000	99,000
Toledo	1,103,000	1,291,000
Buffalo	1,621,000	112,000
	18,792,000	8,501,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 172,000 bushels of wheat and an increase of 645,000 bushels of corn.

A chart of the whole of Georgian bay, the best thing of its kind as yet published, has recently been issued by the British admiralty, and may be had from the Marine Review, No. 409 Perry-Payne building. Another chart, of a very clear and interesting kind, taking in Lake Huron, Georgian bay, Lake Erie and connecting channels, has also been issued recently by the same authority.

A Very Desirable

train to take when going to New York is Pennsylvania No. 6, leaving Union station 1:40 p. m. daily and from Euclid avenue 1:50 reaching New York 7:40 next morning. Pullman sleeper through without change. Supper served in dining car. Apl 15

It is announced that the Cramps of Philadelphia will build for Howard Gould one of the most magnificent steam yachts afloat, but a description of plans has not as yet been given out.

Around the Lakes.

W. P. McKenney of Chicago will be steward of the steamer Republic during the coming season.

The shipyard at Manistee, Mich., will hereafter be operated by a company of which R. Thorsen is president and J. H. Grant treasurer.

Capt. Henry Brock, who was best known as a master in the Bradley fleet, has been appointed harbor master in Cleveland, succeeding the late Capt. Geo. Warner.

Capt. Telesford Boutin who has been in the life saving service on the lakes for ten years, has resigned the position of keeper of the Milwaukee station and will go into business at Chicago.

The Cleveland Ship Building Co. secured from Pickands, Mather & Co., Thursday, the order for some fifteen small deck hoists that are to be used on vessels managed by Pickands, Mather & Co.

Hughes Bros. & Bangs of Syracuse, N. Y., have divided their big Buffalo breakwater contract with Dunbar & Sullivan and the two firms will prosecute the work with H. T. Dunbar as manager.

Capt. Robert Moore, who sailed vessels for Byron Whitaker and the late Capt. E. B. Ward, died at his home in Detroit a few days ago. He had sailed for nearly half a century but retired about six weeks ago.

Capt. Alex. McDougall of the American Steel Barge Co. has been instructed by directors of the company to go ahead with the work of preparing plans for a second dry dock at West Superior, to be about 450 feet long.

Geo. G. Hadley of Toledo is no longer interested in vessel property. W. P. Rend, Chicago coal dealer, is in possession of Mr. Hadley's interest in the steamer Geo. G. Hadley and Leander Burdick controls the Panther and Massassoit.

Capt. Al. Reed, who commanded the steamer Maricopa last season, is to sail the Brazil, vice Capt. Gibson. Capt. John Smith has been transferred from the E. C. Pope to the Selwyn Eddy. Capt. Williams, last season mate of the Boston, will command the Nyanza.

An advertisement elsewhere in this issue from Major T. W. Symons, United States engineer at Buffalo, calls for proposals for harbor excavation and the construction of a timber and concrete breakwater at Dunkirk, Lake Erie, under a continuous contract. Bids will be opened Monday, March 22.

More competition between the Grummond line and the Detroit & Cleveland Steam Navigation Co. in freight and passenger business between Cleveland and Detroit may be expected next season. Bartlett & Tinker, agents of the Grummond line, announce that, ice permitting, they will have a boat leave Cleveland on Tuesday, the 28th inst.

During the season of 1896 W. W. Richardson & Co. forwarded form their Dead river mill to the Cleveland Saw Mill & Lumber Co., 24,699,076 feet of lumber, 3,837,000 lath and 2,989,250 shingles, all of whichwas carried by the steamer John B. Ketcham, 2d. The Ketcham, of which Capt. M. Christy is master, made twenty four trips between May 1 and Nov. 28.

With the passage of the sundry civil appropriation bill, full appropriations will have been secured for the two new lake revenue cutters on which bids are to be opened by the treasury department March 15. An advertisement elsewhere in this issue gives details regarding the proposals. The new vessels will be practically the same as the Gresham, recently completed by the Globe Iron Works Company, Cleveland.

The oil tank barge under construction at the works of the Union Dry Dock Co., Buffalo, for the Standard Oil Co. was launched Saturday. This vessel is 254 feet keel, 262 feet over all, 40 feet beam and 23 feet molded depth, with a capacity of 941,000 gallons of crude oil on 16 feet 10 inches draft. She has fourteen transverse water tight bulkheads and eight oil compartments, which are separated from the fore and after part of the ship by two steel cofferdams. She has a steam windlass and capstan, steam towing machine, steam steerer, electric lighting plant and large steam pump for loading and unloading cargo of oil, which will be carried from Whiting, Ind., to Duluth, Minn., the return trip being made with iron ore from Lake Superior ports to Chicago. She has a double bottom for water ballast under the oil compartments. Blake pumps are used. This barge was contracted for last February and the dry dock company is to deliver her at Chicago about April 15.

Approved by the Steamboat Inspectors.

As usual a long list of new types of marine boilers—water tube, coil, pipe, etc.—were approved by the United States board of supervising inspectors at their annual meeting, held recently in Washington. Following is a list of the manufacturers or patentees who secured approval of boilers: W. M. Towers, Rome, Ga.; Chas. Seabury, Nyack, N. Y.; Luppold Bros., Buffalo, N. Y.; Barr, Reynolds & Co., Rochester, N. Y.; Dearing Water Tube Boiler Co., Detroit, Mich.; Benjamin A. Wyatt, Boston, Mass.; Wm. Oldman, Buffalo, N. Y.; Winthrop Thayer, Boston, Mass.; G. F. Martin, St. Joseph, Mich.; Charles Staples, Jr., Portland, Me.; Osceola Currier, Newark, N. J.; Paul W. Lichtenberger, Philadelphia, Pa.; Charles Ward, Charleston, W.Va.; Almy Water Tube Boiler Co., Providence, R. I.; James Burt, Houghton, Mich.: August Miller, Jefferson Parish, La.; Thomas Fearon, Yonkers, N. Y.; Fore River Engine Co., Weighmouth, Mass.; W. T. Clark, Boston, Mass.; New York Steam Power Co., New York, N. Y.; H. C. Thompson, Philadelphia, Pa.; Horace See, New York, N. Y.; James C. Wignall, Philadelphia, Pa.; Wm. Cramp & Sons, Philadelphia, Pa.; Charles M. Weber, Cincinnati, O.; Robert H. Bushman, Baltimore, Md.; George Bolland, Pittsburg, Pa.; D. A. Parks, Brooklyn, N. Y., and Charles Ogle & J. Hall, Jeffersonville, Ind. In boiler appliances approval was granted to E. E. Roberts of New York on the Roberts boiler; to H. W. Cramp, Philadelphia, Pa., on auxiliary steam piping; H. T. Hayward, Jersey City, N. J., steam piping on ferry boats; G. W. Carpentier, shutting stop valve automatically; Wm. H. Miller, down draft furnace and steam generator; Theo. Gueminey, Pittsburg, Pa., circulating water in boilers and feed water heaters and fitters.

TREASURY DEPARTMENT, WASHINGTON, D. C., February 8, 1897.—Sealed proposals are hereby invited and will be received at this Department until 2 o'clock p. m., Monday, March 15, 1897, at which time and place they will be opened in the presence of attending bidders, for the construction by contract of *two* steel steam propellers for the U S. Revenue Cutter Service, for service on the Great Lakes, to be known while in course of construction or until launched, as "Nos. 4 and 5 R. C. S." Bids will be received, on *separate forms of proposal*, for either or both of the vessels. Said vessels are to be constructed in accordance with plans an specifications provided by the Secretary of the Treasury, which together with the forms of proposal, contract, etc., may be obtained upon application to this Department Proposals will be considered only from such shipbuilders as can show to the satisfaction of the Secretary of the Treasury that they are possessed of the necessary plant and facilities for the performance of the work. Evidence as to this ability must accompany the proposal. Each proposal must include the construction of the vessel and her machinery, complete in all respects as required by the plans and specifications. Each of said vessels must be completed and delivered at such port on the Great Lakes as may be designated by the Secretary of the Treasury, *at the earliest practicable date*, and bidders are informed that, because of the urgent need of speedy delivery, the element of time will be given due consideration in determining the award of the contract. *Each* proposal must be accompanied with a cash deposit or certified check payable to the order of the Secretary of the Treasury, in the sum of five thousand dollars ($5,000). The certified check of the successful bidder will be retained until the execution of a formal bond or contract, and the approval of the same by the Secretary of the Treasury, and the certified checks of the unsuccessful bidders will be returned immediately after the proposal of the successful bidder shall have been accepted. Bids must be addressed to the Secretary of the Treasury, and be indorsed on the envelope "Proposals for Revenue Steamers for Great Lakes." The right is reserved to reject any or all bids and to waive defects if deemed for the interest of the Government so to do. W. E. CURTIS, Acting Secretary.

THE L. P. & J. A. SMITH CO.,

Contractors of Public Works.

DREDGING,
PILE-DRIVING,
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DRY DOCKS and
PIER BUILDING.

RAILROADS,
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&c., &c.,

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THE PRICE TO BE PAID FOR CARRYING ORE

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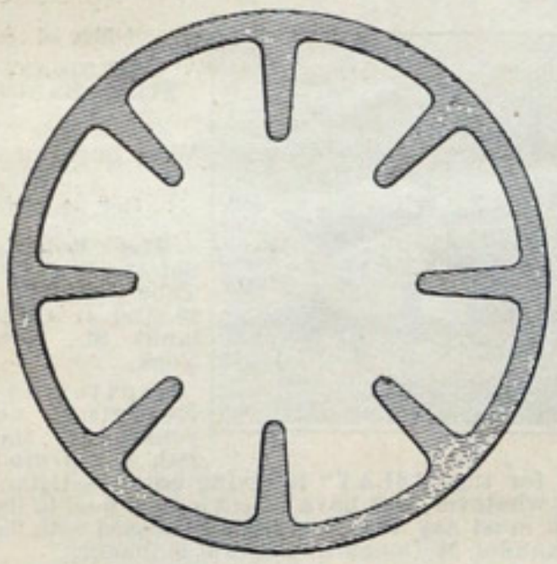

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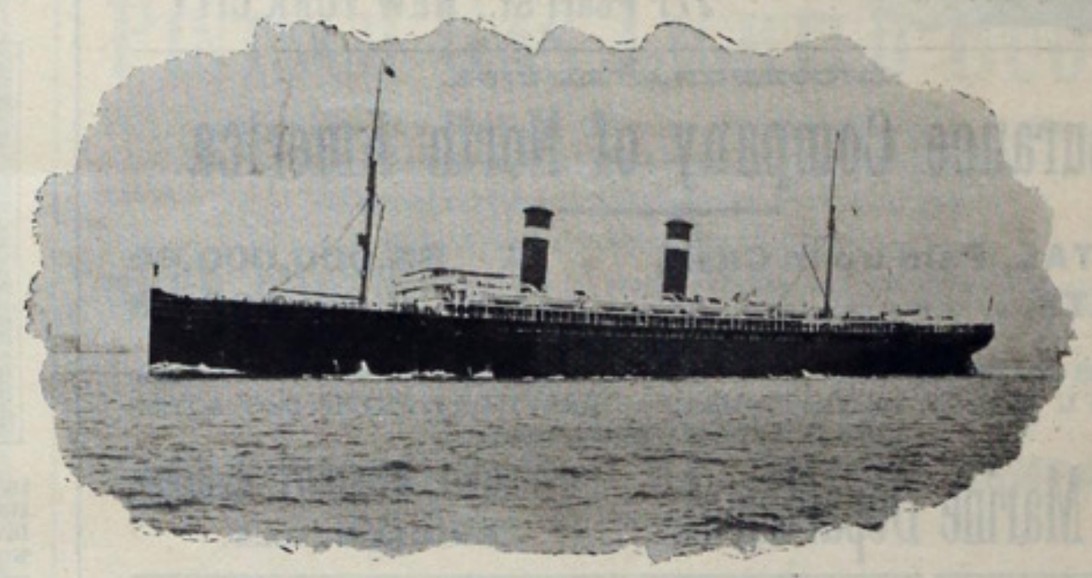

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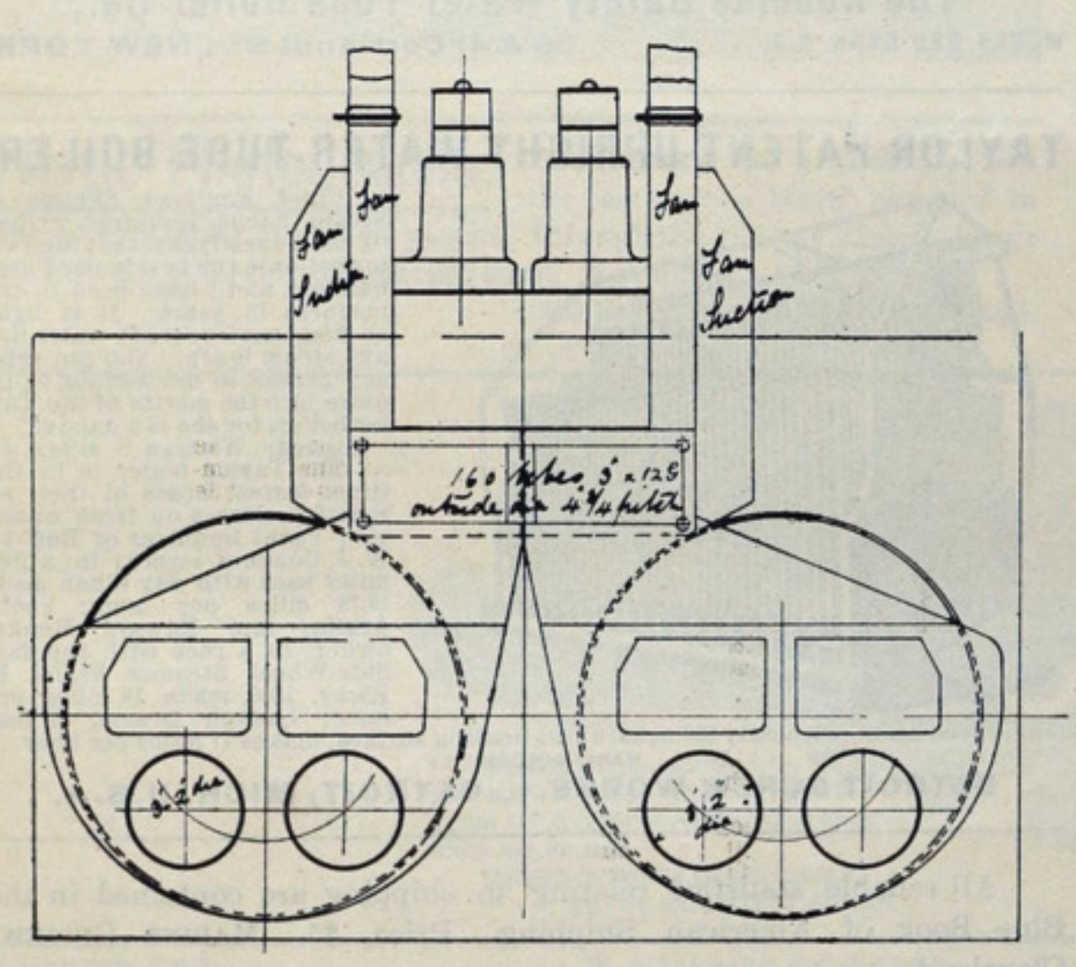

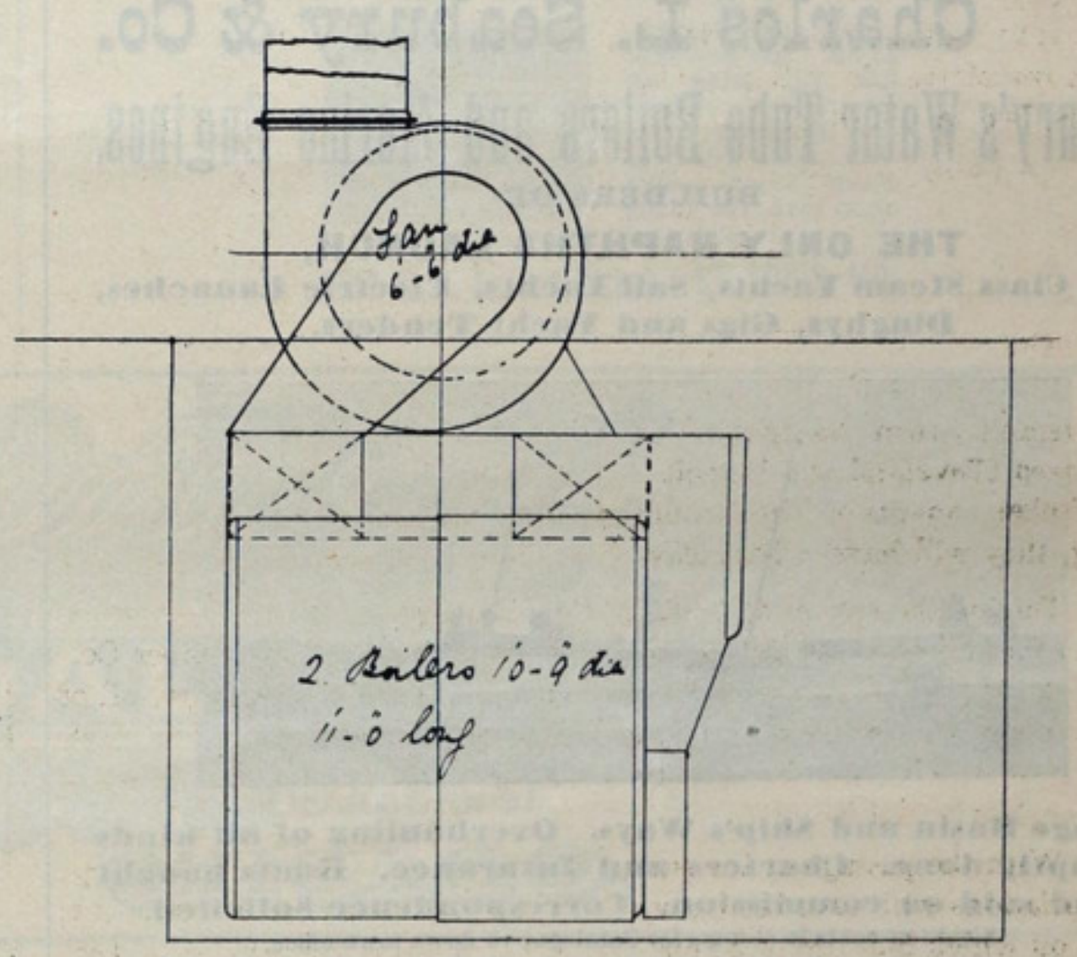

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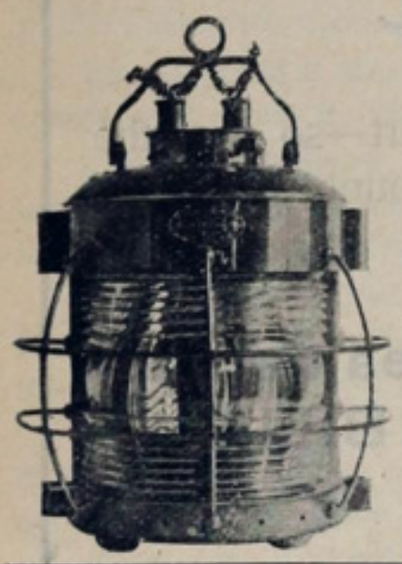

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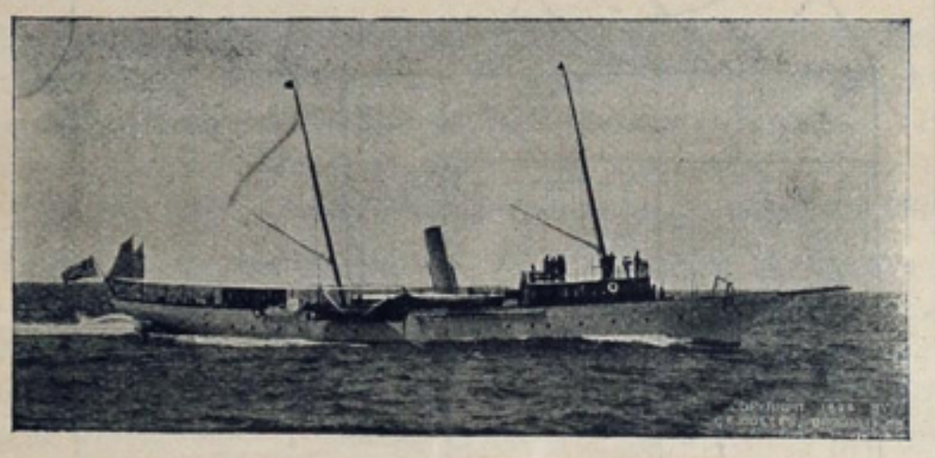

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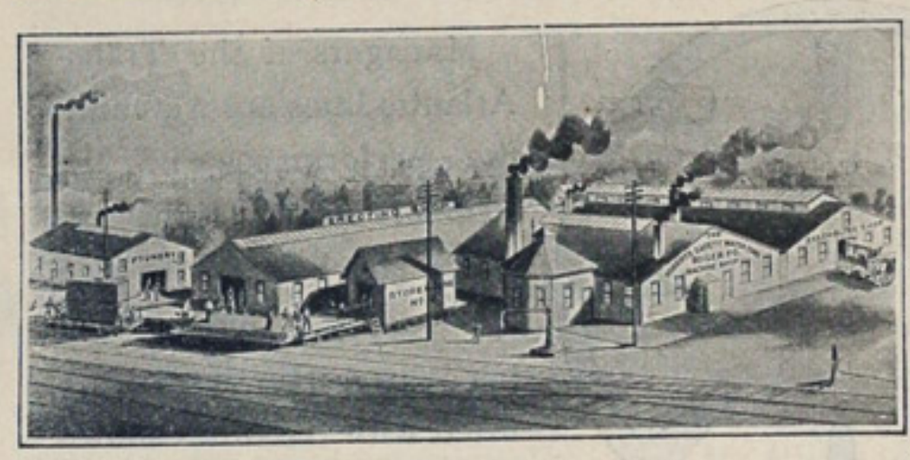

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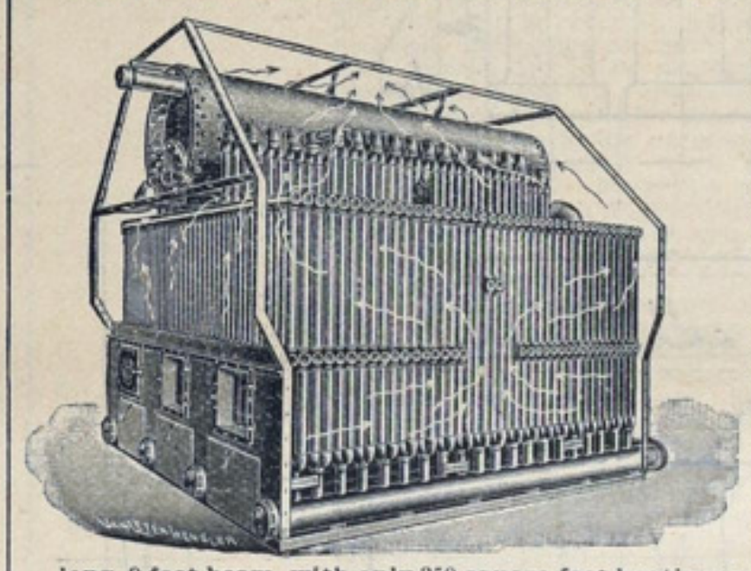

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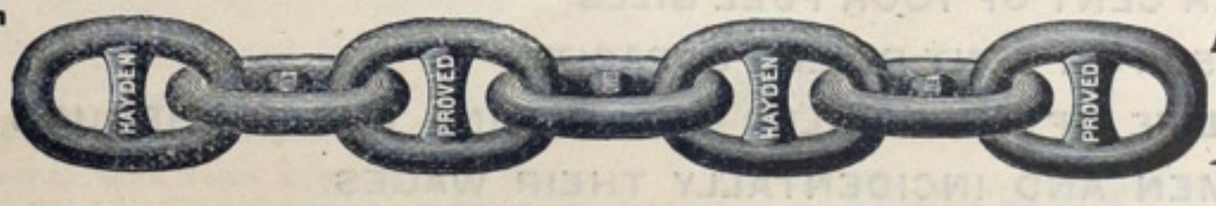

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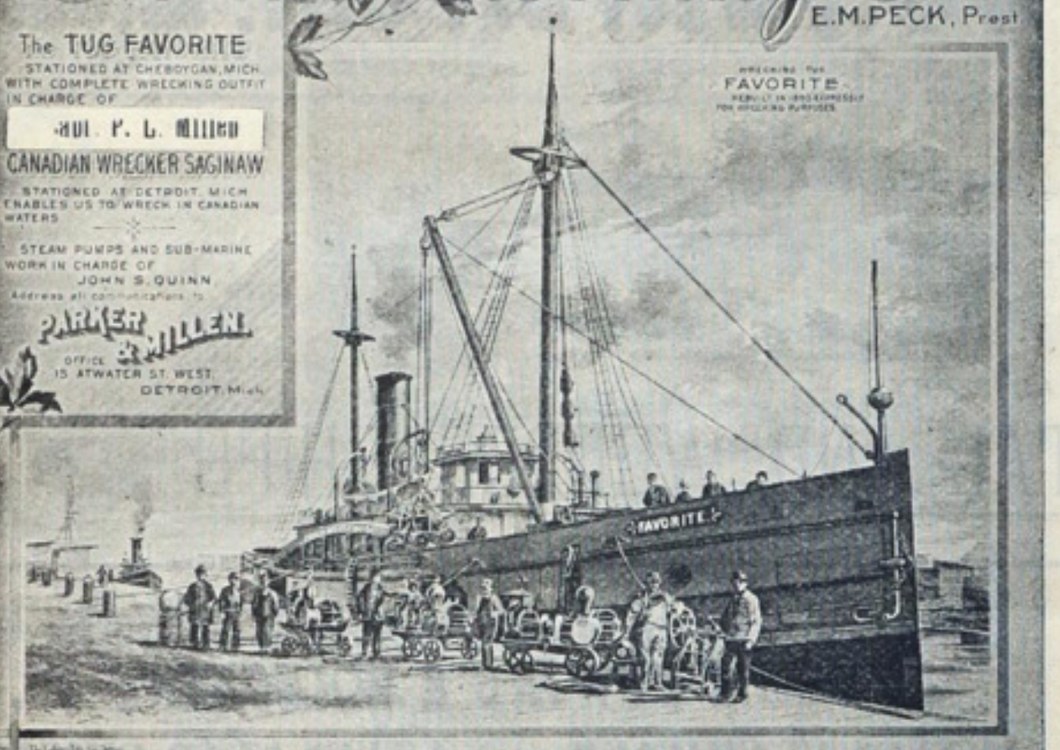

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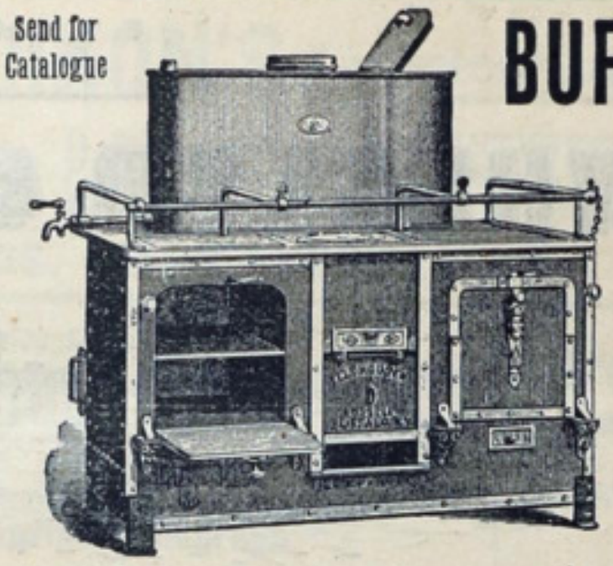

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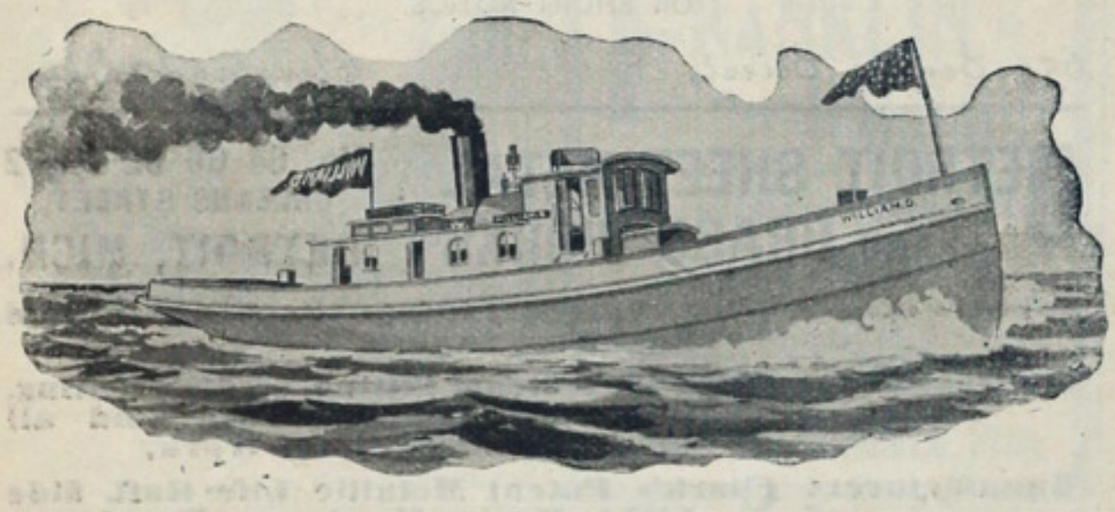

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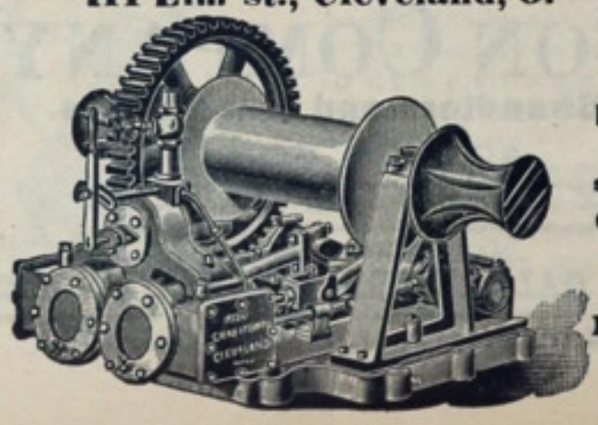

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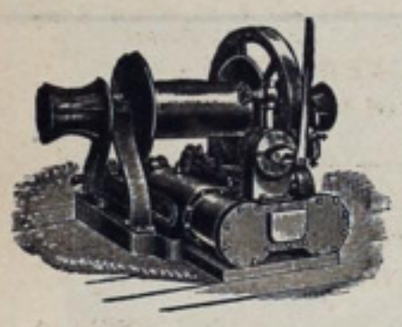

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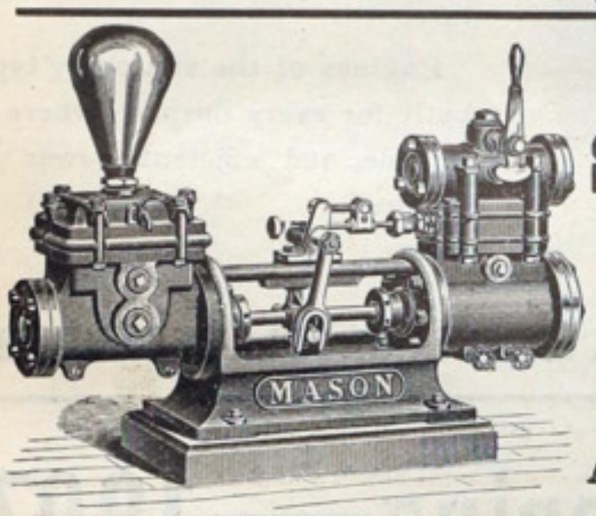

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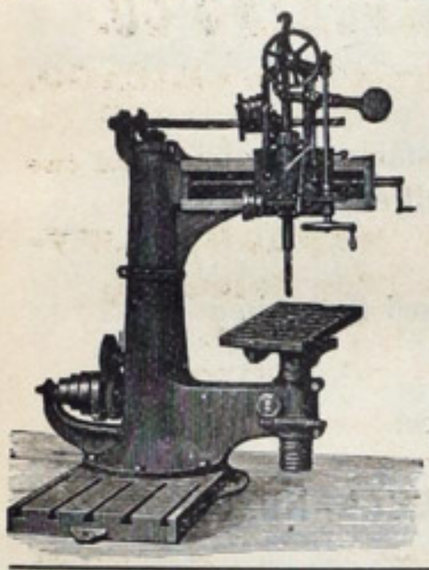

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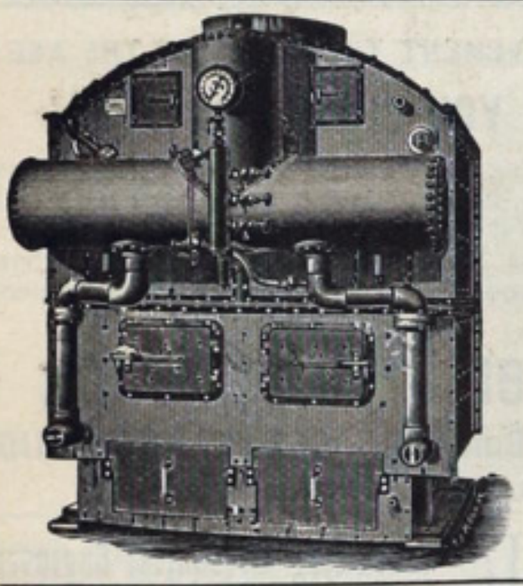

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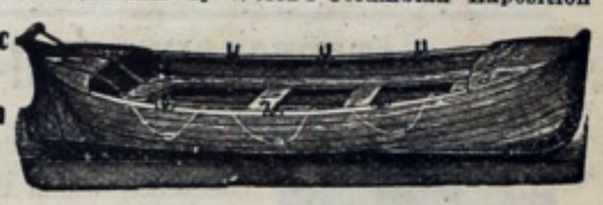

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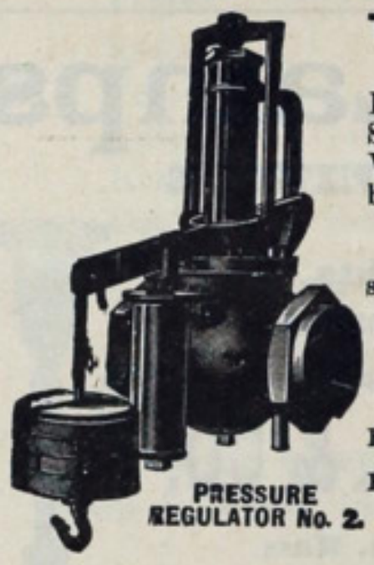

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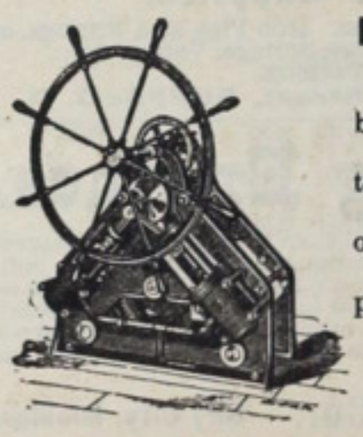

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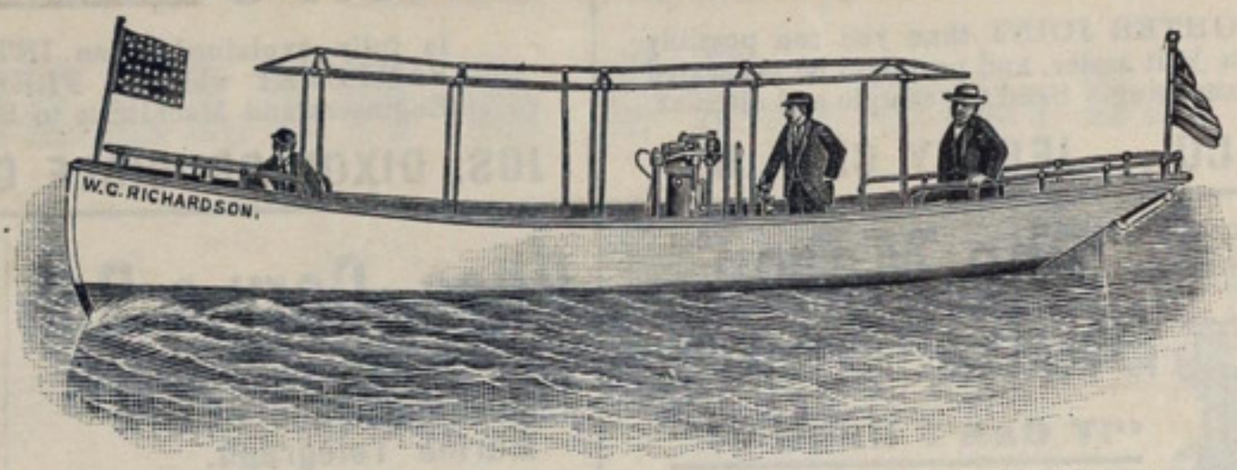

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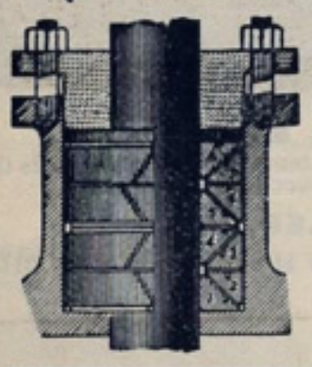

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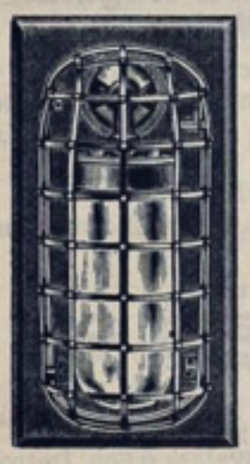

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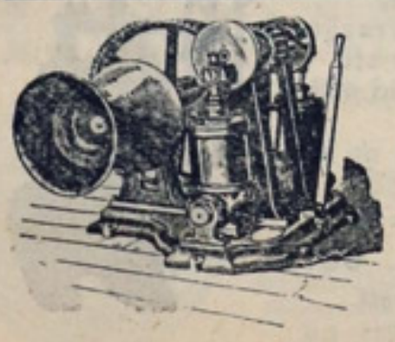

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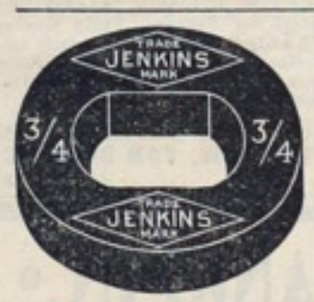

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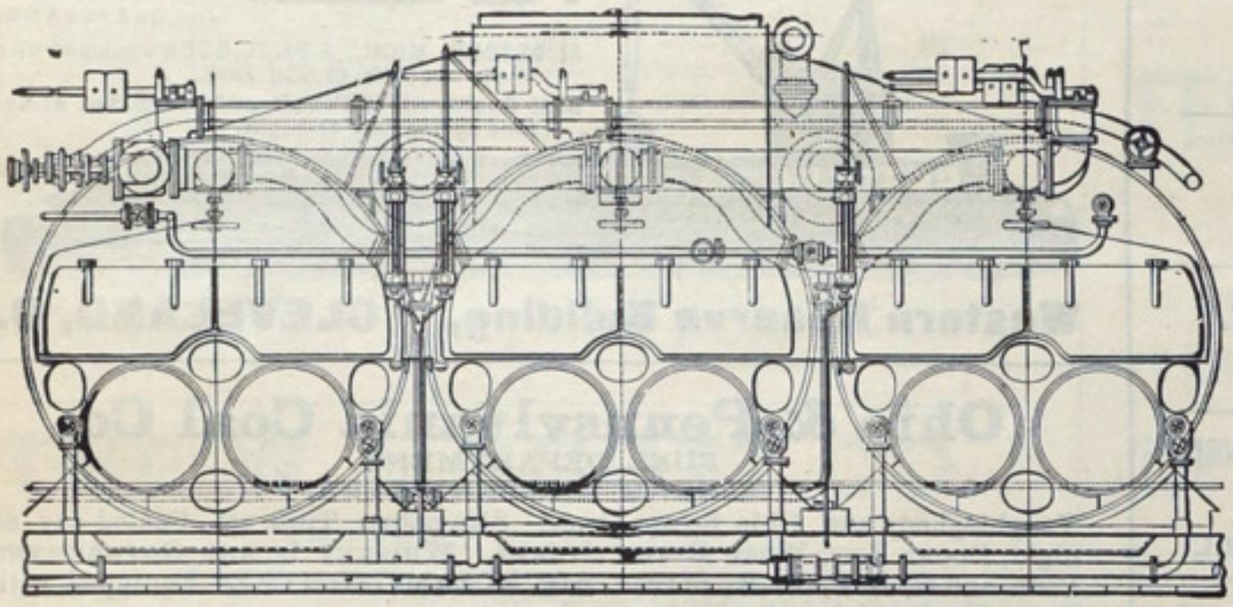

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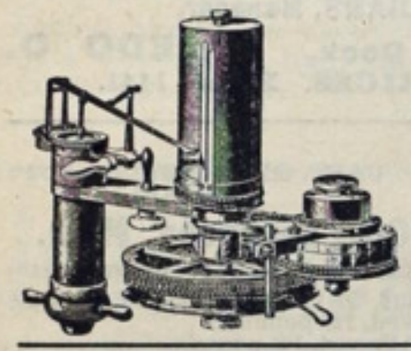

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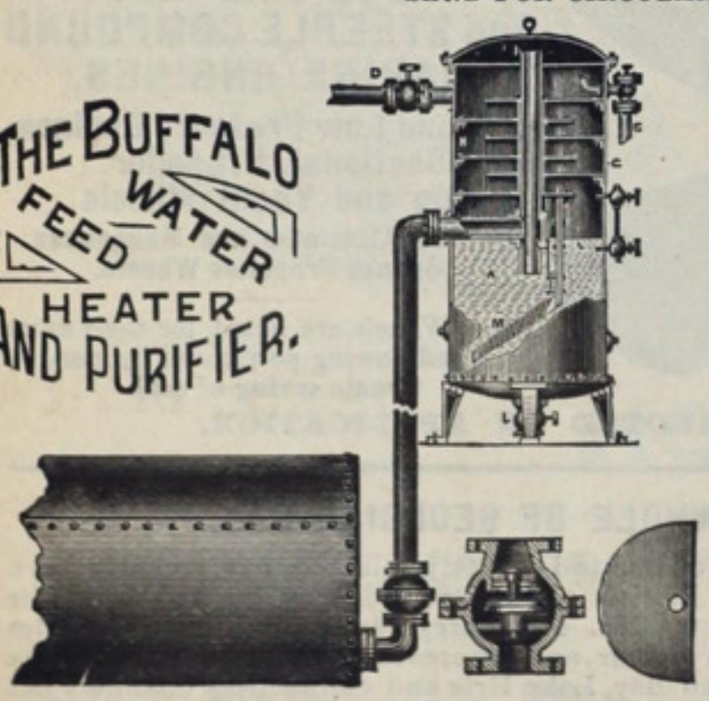

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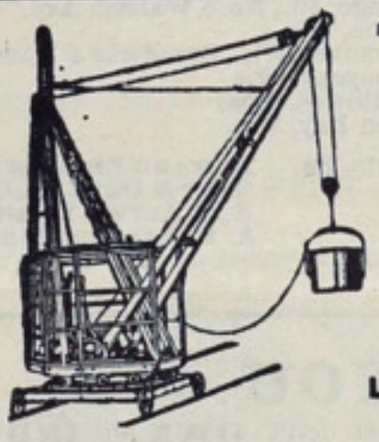

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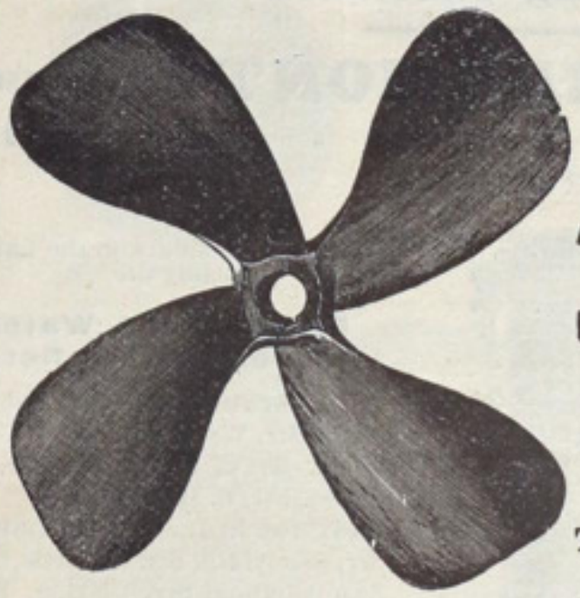

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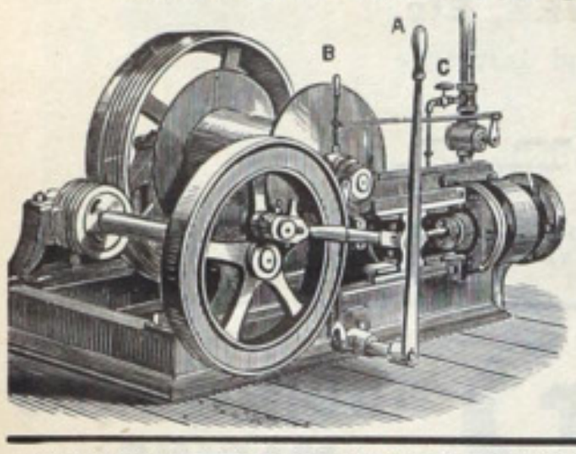

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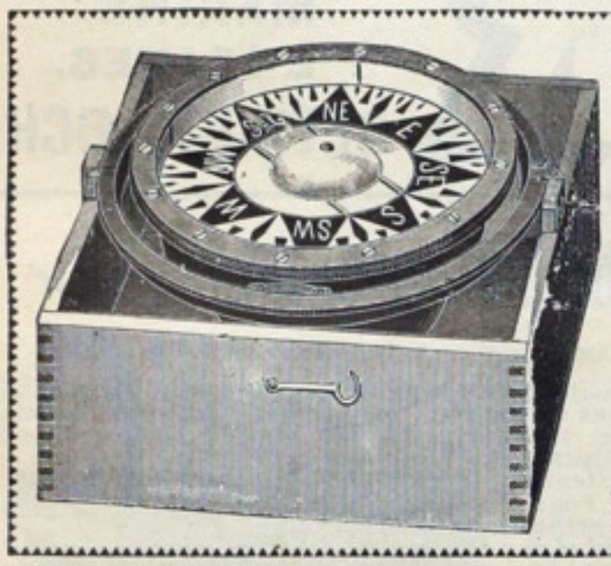

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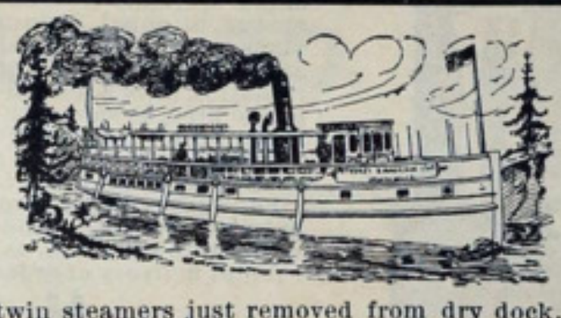

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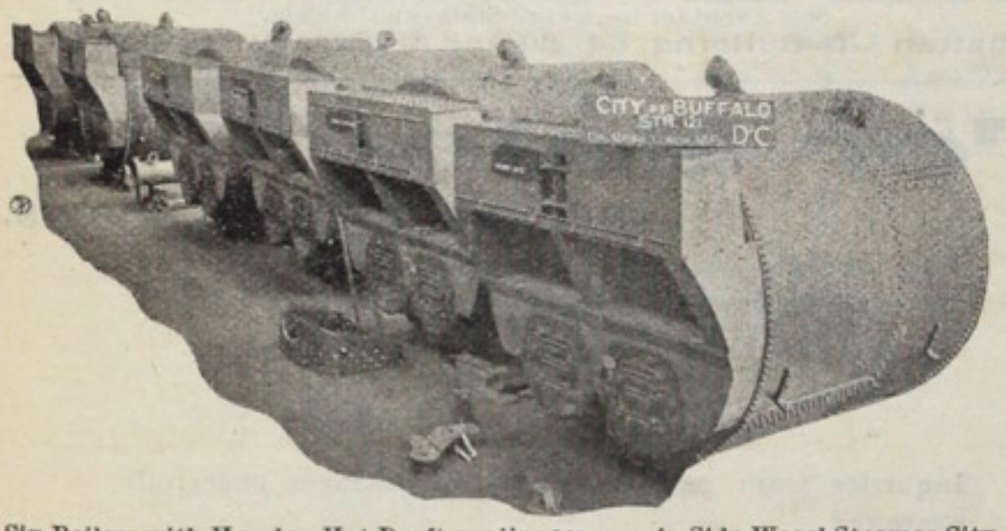

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ECONOMY in operating expenses on Lake Ships must come from reduced coal bills. No great saving can be made in labor cost, and provisions are already low. But fuel bills can be lowered and cheap coal used to advantage by adopting Modern Methods of making steam at low cost.

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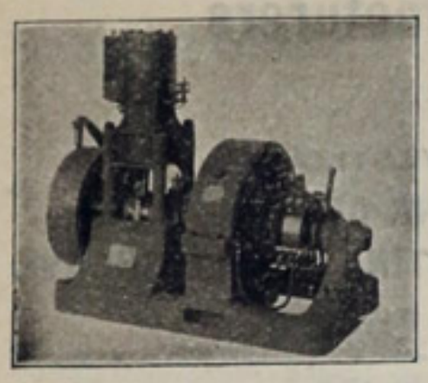

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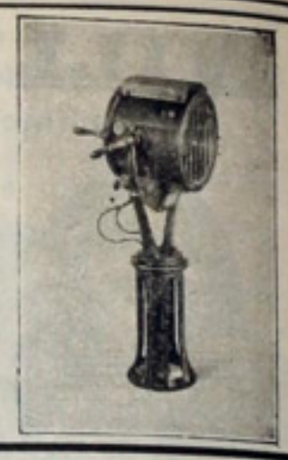

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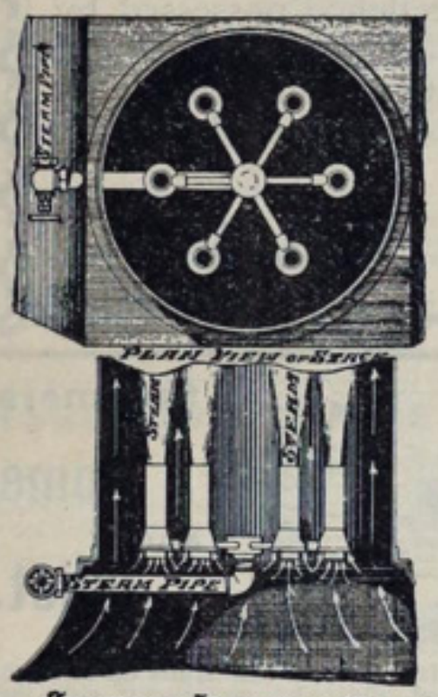

SECTION VIEW OF STACK SHOWING JET IN OPERATION

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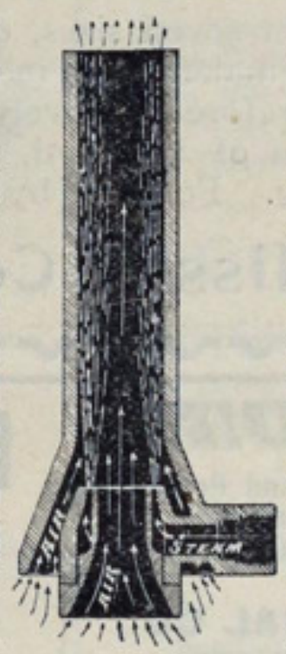
For Smoke Stacks of Steam Boilers.

Acknowledged as the most powerful and economical jet on the market, giving results equal to forced draft with fan. Works well at all steam pressures.

In use on the fast Sound Steamer City of Lowell and famous Delaware River Strs. City of Chester and Brandywine, together with several Cuban and Mexican Strs. Also many Steamships, Side Wheel and Propeller, Lake, Bay and River Strs. Cut on the right shows sectional view of castings, which are spaced at equal distances throughout the stack, making an equal subdivision of its area. These castings are attached to pipes radiating from a central casting attached to steam pipe, as shown on the left. Steam is supplied through these pipes to each casting discharging through an annular opening, as shown by dotted lines, causing a current of air and gases to flow through the central and outside air passages, and discharge at a high velocity up the stack, as shown by arrows. Prompt delivery of orders guaranteed.



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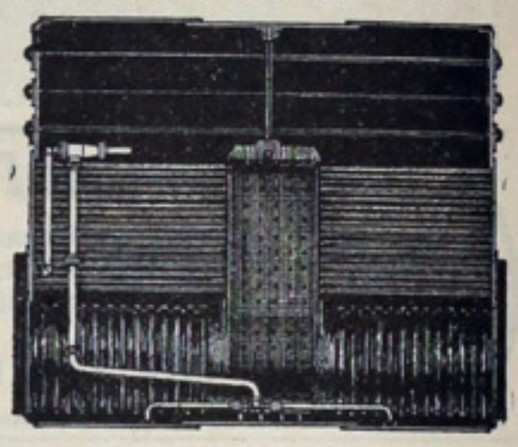
Equalizes expansion and increases evaporation, thereby saving coal and preventing leaks, thus saving cost of repairs. Prevents foaming or priming and pitting, thus increasing safety and prolonging life of boiler. In use on the International Nav'n Co's Steamers Paris, Southwark, Pennsylvania and Illinois; Steam Ships Gloucester and Howard of Merch'ts and Miners Line; Sound Steamers City of Lowell and Richard Peck; fishing steamer Al. Foster; Delaware River Steamers City of Chester and Brandywine; and many steam yachts and tug boats, giving remarkable results. Used by Harlan & Hollingsworth Co., Bath Iron Works, Maryland Steel Co., and others. Castings carried in stock for prompt delivery.



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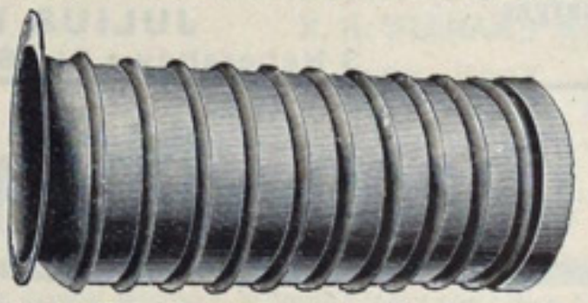
PURVES' RIBBED STEEL BOILER FURNACE FLUE.

BACK END.



FRONT END.

With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

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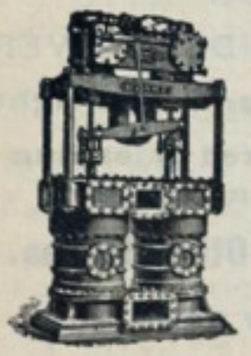

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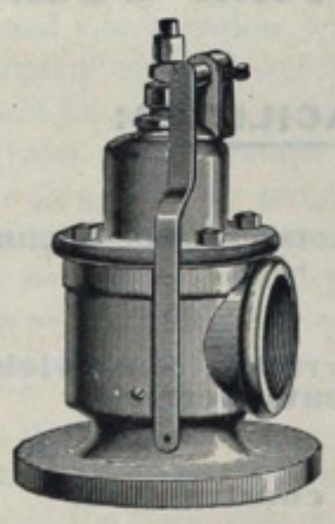

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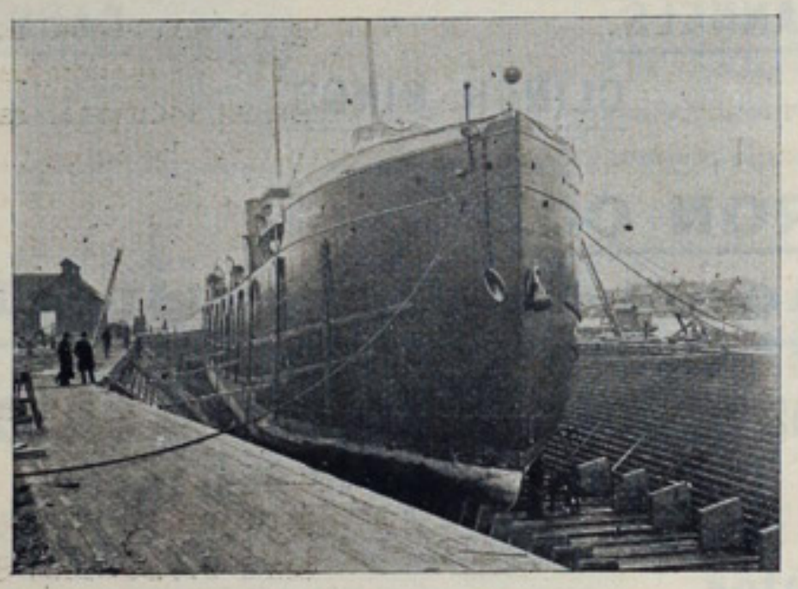

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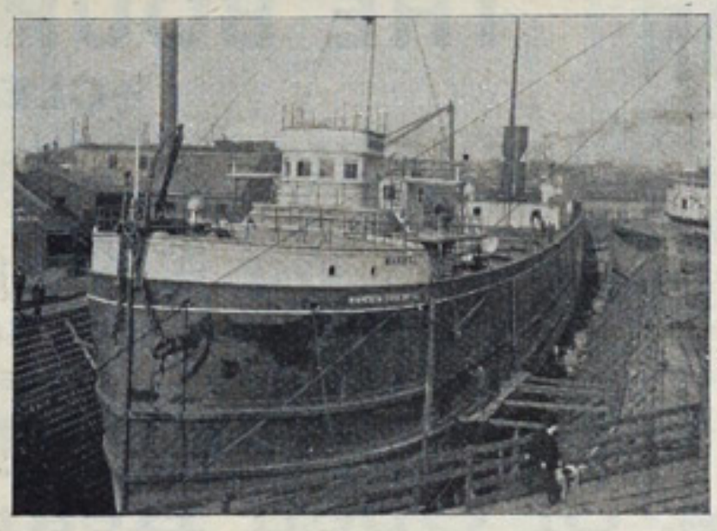

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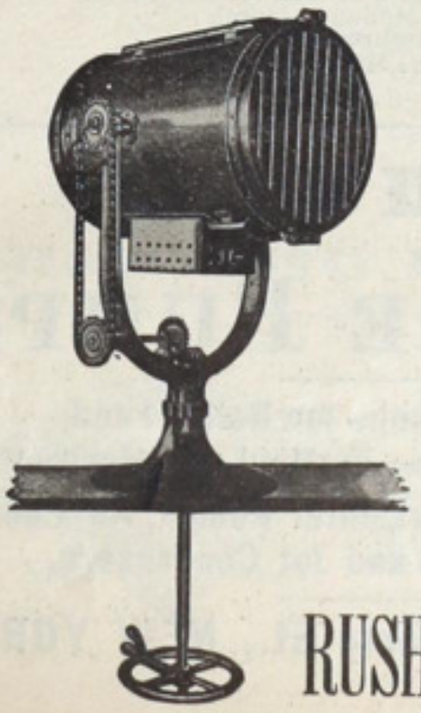

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